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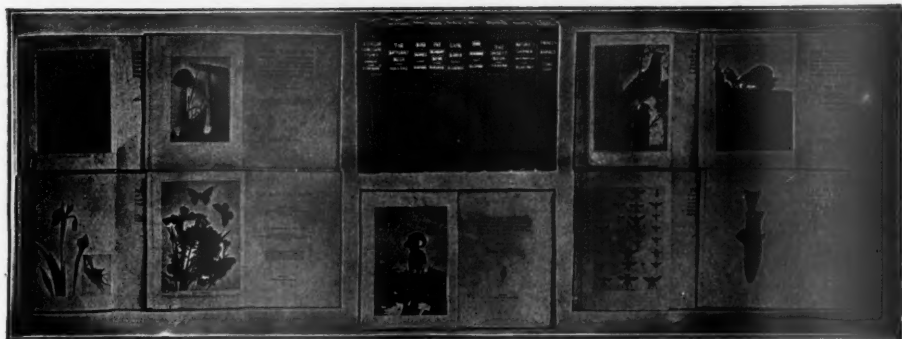
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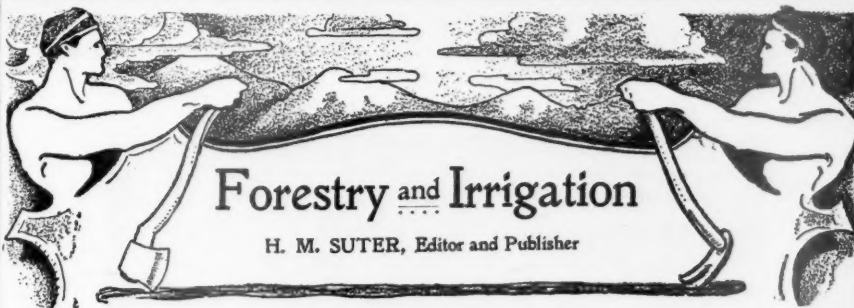
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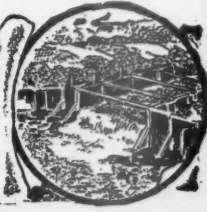
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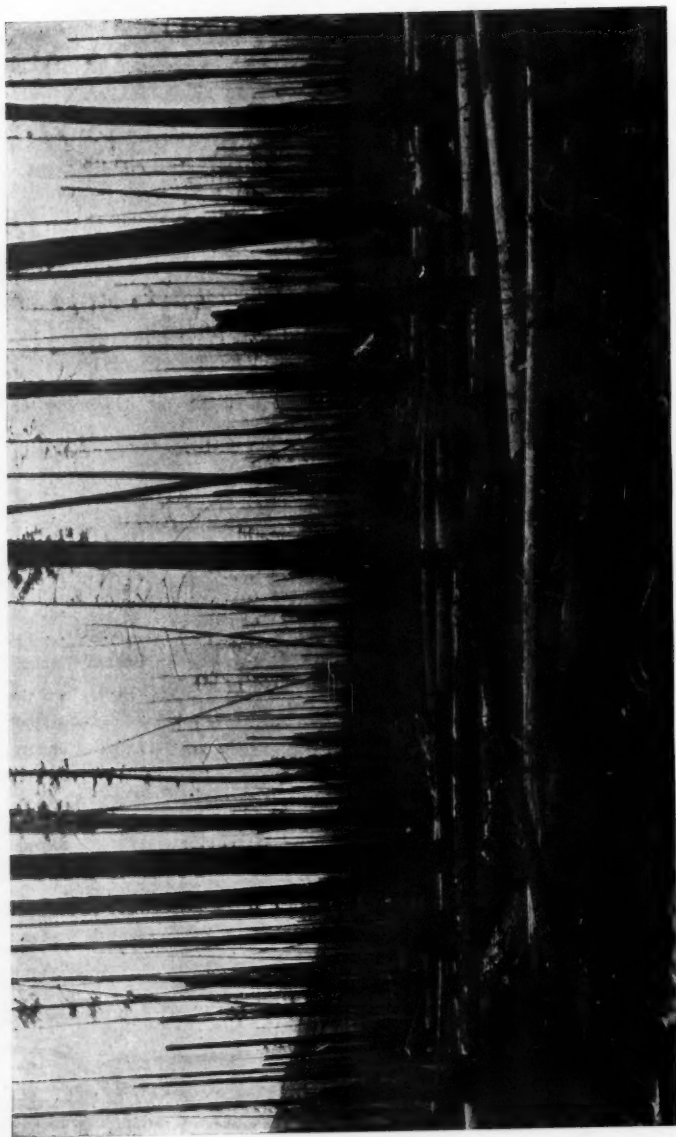
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VIEW SHOWING ABSOLUTE DESTRUCTION OF A FOREST BY FIRE.

# Forestry and Irrigation.

VOL. IX.

SEPTEMBER, 1903.

No. 9.

## NEWS AND NOTES.

### **A Pointer for the Irrigation Congress.**

The Eleventh National Irrigation Congress will meet at Ogden, Utah, September 15-18, fuller announcement of which is given on page 452 of this issue. The questions to come before this congress are matters of vital concern to the entire nation. There will be reports from experts in the lines of irrigation and forestry, discussions of legal complications arising in the field of irrigation, the application of the provisions of the National Irrigation Act, and the important question of colonization. The open discussion of these topics will undoubtedly be of great value. But an omission, an unintentional one we trust, is that no direct reference has been made in the preliminary program to the question of the repeal of the existing land laws. If the National Irrigation Act is to bring that measure of value in the development of the arid regions that its framers intended, if the development of the West is to proceed steadily and along safe lines, the Desert Land Law, the Timber and Stone Act, and the commutation clause of the Homestead Act must be repealed. At present much of the land that can be made valuable through the carrying out of the provisions of the National Irrigation Act is being gobbled up by speculators, in many cases fraudulently. If this is allowed to continue, the very purpose of the National Irrigation Act, the providing of homes for the small settler on the public domain, will be defeated. The Eleventh National Irrigation Congress owes the movement for the repeal of the land laws a hearty indorsement. If only this is done by the congress, it will be a decided success. To fail to do it is

an acknowledgment by the delegates to the congress of their ignorance of the real needs of the West, or acquiescence in the stealing of the public lands that is going on at an alarming rate under the present laws.

### **Eastern Interest in Repeal of Land Laws.**

While on the subject of the repeal of the existing land laws it might be well to remind readers of FORESTRY AND IRRIGATION that this is by no means a question for western people only. The disposal of the remaining public domain is a problem of grave importance to every section of the country, and every patriotic citizen owes it as his duty as such to take an active interest in its solution. The public lands, the only outlet for our rapidly increasing population, are being gobbled up by speculators. The result will be that soon the only valuable lands for settlement will be in the hands of speculators, who will hold them at such high prices as to discourage small settlers, or they will go to make huge ranches and landed estates, thus preventing full settlement and development of the West. This acquiring of lands is being done in a manner so glaringly fraudulent as to make the rottenness of some of our municipal governments seem mild in comparison. The land laws have been so perverted from the original intent of their framers that they have become a positive menace to the country. The article elsewhere in this issue by William E. Smythe on "The Home-maker or the Speculator" points out very forcibly the dangerous position the nation is drifting into on the public-land question.

The land-grabbers are very wide awake, while the general public is not, and the danger is that it may not be until too late. The remedy rests with Congress, and Congress will not act until public opinion insists upon its acting. The efforts thus far made in Congress looking to a cure for this evil have been thwarted by the friends of the speculators in Congress, who are at all times very active. The land laws should be repealed along the lines laid down by President Roosevelt in his message to the last session of the 57th Congress. The time to act is now.



**Kicking About Forest Reserves.** In Wyoming certain residents are howling loudly against the extension of the boundaries of the Yellowstone Forest Reserve. They protest that the extension of the reserve interferes with the pasturing of their sheep and cattle, and that the live-stock industry in this section is thus greatly retarded. Their protests smack a good deal of the ignorance of the real object of setting aside forest reserves that has been heard in other sections of the West. The reserves are made to furnish timber and to conserve water. It is not meant that the public domain shall be given over to large cattle and sheep ranchers to the exclusion of the balance of the people. And this is exactly where the protest originates. Long and unrestricted use of the public lands for private interests has bred a class who have no respect for the law, and who oppose the government in every step it makes in trying to administer the remaining public resources for the benefit of all the people. A favorite trick of this class to cover their designs is to shriek out against the supposed injustice that forest reserves do to the small settler. This is highly ridiculous, for were the small settler where the average large rancher wished him, he would need the sympathy and help of all of us.

That the forest reserves are of great value in preserving the water and timber resources of the West is indisputable. Considering the great area they cover

and the number of people they affect, the amount of inconvenience they cause is unusually small. The rules governing the reserves are liberal. They allow settlers a reasonable amount of free timber; mineral claims may be developed, and the owners of agricultural lands within the borders of reserves are protected. Grazing also is permitted under proper restrictions in nearly all the reserves. But the government is breaking up the stealing of timber as a business and the fencing of public grazing lands by ranchers. This brings the bulk of the opposition to forest reserves.

President Roosevelt, in increasing the reserves, is merely carrying out the policy of every Executive since the inauguration of the forest reserve policy under President Harrison. He has a more intimate knowledge of the conditions and needs of the West than any previous Executive, and for this very good reason his work along this line will be of greater value.

Take away the howl of the "grafters" and the opposition to forest reserves will crumble. A perusal of the Forest Reserve Manual issued by the Department of the Interior by any fair-minded person will convince them of the fairness of the government's side of the matter.



**Want Forest Reserves.** In striking contrast to the foregoing claims that forest reserves are ruining their country is a petition recently received by the Department of the Interior. This petition, signed by 95 per cent of the male residents of the Teton Basin, lying in Fremont and Bingham counties, Idaho, and just outside the boundaries of the much criticised Yellowstone Forest Reserve, asks that this region be set aside as a forest reserve.

The petitioners give as reasons for their request that reckless lumbering is ruining both old and young timber, overgrazing is having a decidedly bad effect on water supply, and that herders have been responsible for forest fires that have done great damage to the

timber and water resources of the region.

A second petition, signed by practically all the settlers of the region, calls for the establishment of a forest reserve in certain mountain lands known as the Shoshone Range in Cassia county, south central Idaho. Here, too, the timber resources have been recklessly treated and are rapidly nearing an end, while at the same time the water supply of the region is seriously threatened. The petition is accompanied by a plot of the lands which are asked to be reserved; they include about 185,000 acres.

**Sound Advice.** The following sensible advice to its readers is given by the Saratoga (Wyo.) *Sun*, one of the most ably edited newspapers in the state:

"Gentlemen, when you get done howling over the forest reserve question, suppose you take up something else just for a change. The forest reserves will, no doubt, be modified and made to comply as nearly as may be with the timbered area, for really the government is not interested with anything else. When that is done, and done properly, rest assured that the forest reserve is there to stay. And you can rest assured of another thing—that the government is not going to allow the reserves to be turned into pasture lands for the benefit of stockmen. The government is setting aside these reserves for the purpose of preserving the timber on them, in order to hold the snow to make water for irrigation purposes, to carry out the great plan inaugurated when the irrigation bill was passed. The government (and every sane person) recognizes the fact that it is the man who builds ditches and plants alfalfa, grain, and vegetables that is the bone and sinew of the country, and it is for the home-maker that all of this forest reserve and irrigation work is being done, and not for the man who travels in a sheep wagon here and there over the country or roams the land with a round-up wagon and a band of cowboys. Howl as much as you have a mind to, but you will find in the end

that the President knows exactly what he is doing and why he is doing it."

#### A New Use for Forest Reserves.

A new use for forest reserves has been discovered in Wyoming by way of New York. In the August number of the *North American Review* there is an article on "Aggressive Forest Reservation," by James P. Kimball. The author of this article has large ranching interests in the region of the Yellowstone Forest Reserve in Wyoming, and he resents very bitterly the extension of the boundaries of this reserve, even though the government is reserving its own land. Not so long ago the Department of the Interior refused to eliminate a large tract of land from the Cascade Forest Reserve in Oregon which would have benefited a certain mining company in which Mr. Kimball was deeply interested. So much for Mr. Kimball and his reasons for writing an article objecting to the forest-reserve policy of the government.

The *North American Review* is devoted to the discussion of the world's great questions, if we are to believe some of its advertisements of itself. But as deeply as FORESTRY AND IRRIGATION is interested in forest reserves and all matters relating to our forests, we cannot see that the ground covered by this article is so important as to give it a place among the contributions of "the earth's intellectual leaders." Further, it is not the editor's keen interest in forest matters that decided him in selecting this article for publication. As Mr. Kipling says, "that is another story."

The editor of the *North American Review* is at the head of a well-known publishing house, and he directs several other publications, notably *Harper's Weekly*. He is backed by, and owes allegiance to, large moneyed interests that are hostile to President Roosevelt. Under pretended friendly guise his publications have been carrying on a very contemptible campaign, trying to arouse feeling against the President. Any person who knows the situation and has read *Harper's Weekly* the past few months understands this fully.

And here is the kernel of the little story: Mr. Kimball collided with the government while it was making forest reserves—once, twice. He was provoked and immediately set down his opinions in an article under the title mentioned. We are ready to say that it is a well-written article, though disagreeing decidedly with the contents of it. The writer knew of the attitude of Colonel Harvey's publications and picked them out as the most likely place to get a hearing.

Colonel Harvey, reading this article, found that it talked much of the "cult" of forest preservation, whatever that may mean. It charged the government with setting up a large game preserve in Wyoming and in harassing the people in the name of the "cult." And all this was aided and abetted by the President. Colonel Harvey knew nothing of the sheep raising and mining business that had prompted the supposedly righteous wail from the Wyoming man. But here seemed a chance to hurt the President with his western friends, and the article was used.

FORESTRY AND IRRIGATION is not a political journal; moreover, it does not agree with all of President Roosevelt's policies, but we cannot refrain from exposing such cheap trickery as the above, especially when it comes within the field of forestry. It is hardly what one would expect from the editor of "A Journal of Civilization."

#### Forestry School at the University of Michigan.

The University of Michigan, at Ann Arbor, has established courses in forestry, the work to be under the direction of Filibert Roth, B. S., professor of forestry, and Charles A. Davis, A. M., instructor in forestry. The university is to be congratulated on two important things in the establishment of such a course. The first is in the selection of Professor Roth as the head of the new school, and the second and even more important is the initial establishment of all work on the basis of graduate study. Such a step in the beginning assures real value for the work done by the

school, will give a better training, and will secure students of broader general education and of more mature minds than if the course were made simply a term of lectures in an undergraduate year. The two years' graduate study leads to the master's degree in forestry. The university is particularly well situated for forest work, and short trips either by steam or trolley cars will take the student to places where all conditions of forest, showing the results of good and bad management, can be met with. The university itself has a forest reserve of over 8,000 acres, and much of the field-work will be carried on in this tract. Requirements for admission and a synopsis of the courses to be pursued, together with other information, may be had by applying to the University of Michigan, Ann Arbor, Mich.

#### First Report of Reclamation Service.

The First Annual Report of the Reclamation Service, by Mr. F. H. Newell, chief engineer, which will be published as a Congressional document, is about to be issued by the United States Geological Survey.

In his letter of transmittal the Director of the Survey notes that the reclamation law of June 17, 1902, which is quoted in full, is so general in its terms that its success or failure may be said to rest almost wholly upon its administration, innumerable details not being touched upon in the law.

The work of examination and survey is described by states. In most instances the field-work is still in progress, and in nearly every locality there are alternative methods of reaching the desired end, the relative merits of which cannot be determined until careful estimates have been made. In brief, it may be stated that work has been carried on in the following localities in the various states and territories: On Salt and Gila rivers in Arizona, on Colorado River in California, on North Platte, Gunnison, and Grand rivers in Colorado; on Snake River in Idaho, on the deep-well problems of western Kansas, on Milk River in Montana, on the artesian-well probabilities of western Nebraska,



on Carson and Truckee rivers in Nevada, on the artesian probabilities of central Oregon, on Bear River in Utah, on Yakima River in Washington, around Lake De Smet, and also on Sweetwater River in Wyoming.

At each of the places where systematic work has been carried on, preliminary temporary withdrawals of public lands have been made, but the areas which may be reclaimed are indicated only in a general way by these temporary segregations. The final determination of the reclaimable area rests upon a summation of all the facts of feasibility and cost, so that it can be stated only as the last of a series of estimates.

The impossibility of stating in advance what lands will ultimately be recommended for reclamation will result in great disappointment to many persons. The fact that lands have been tempo-

rarily set aside is, in the eyes of many, an indication that these lands will be reclaimed; and although every attempt has been made to warn individuals of the futility of filing upon these lands under the homestead law, they persist in taking up the land on the bare possibility that the surveys and examinations will ultimately show it to be reclaimable. It is an unfortunate condition, which apparently cannot be corrected at present.

**Forestry  
at the  
University  
of Maine.**

The University of Maine, at Orono, offers during the spring term of the second year courses in practical farm forestry, including the production of wood crops on the farm, the utilization of waste places, the management of the woodlot,



Courtesy U. S. Department of Agriculture

IRRIGATION COMMUNITY IN VALLEY OF VIRGIN RIVER, UTAH, SHOWING TOWN OF ROCKVILLE AND FARMING LANDS.

the effect of grazing, and the control of fires. The terrible losses suffered by Maine this spring from forest fires point to the fact that the state needs a vigorous forest policy to protect her greatest source of wealth.

### **The Truckee Valley Irrigation Project.**

Although there has been no necessity for as many preliminary steps, and, from this cause, less general comment on the Truckee River project to be undertaken under the provisions of the national irrigation act, still that project is in many ways farther advanced than any of the others. It has been more fortunate than the other four proposed national irrigation ventures from the fact that there was less deeded land lying under its proposed canals, thus making it far easier to adjust land matters. It is predicted that this reclamation scheme will more than double the population of Nevada, and bring a class of home-builders who will do much for the welfare of the state, instead of merely extracting the mineral wealth and having their homes and general interests elsewhere. The contract for canal construction was awarded to Charles A. Warren & Co., of San Francisco, and the E. B. and A. L. Stone Company, of Oakland, Cal., the lowest bidders. It is proposed to take 1,400 cubic feet of water a second from the Truckee River about 30 miles east of Reno, Nevada, and divert it by means of a canal 32 miles long, with laterals extending over some 300,000 acres of land. This will accommodate from 30,000 to 50,000 settlers, and under the administration proposed by the United States each one will be assured of water and at a rate not to exceed \$2 per acre a year.

This is the first definite action taken by the Interior Department looking to actual construction under the reclamation act.

### **California Summer School of Forestry.**

The lectures on forestry held at Idyllwild, San Jacinto Mountains, Riverside county, California, during the past month were well attended, and accomplished

much in the way of properly defining the difference between arboriculture and silviculture, or between æsthetic and economic growing of trees. The forest lesson of most importance to the state of California, and particularly to the southern part of that State, is concerned directly with the water supply for irrigation, and on that account there is great interest in the work of forest preservation and reforestation now being carried on by the Bureau of Forestry.

The regular lectures were under the auspices of the University of California, and were given by Dr. Willis L. Jepson, of the department of botany, and Professor Arnold V. Steubenrauch, of the department of agriculture. The former discussed the life histories of several trees and of those peculiar to California, and the latter took up questions of forestry. In addition to the regular courses, there were several lectures by Ralph S. Hosmer, of the Bureau of Forestry, who is investigating the forest resources of southern California. T. P. Lukens, of Pasadena, an agent of the Bureau, who is greatly interested in reforesting the mountains near the southern California orange groves, spoke of the work he has done toward reforestation and the measures which should be generally recommended.

In this connection it is interesting to note that five members of the Bureau of Forestry are investigating conditions on Mt. Lowe and the surrounding mountains to find out the best trees for reforesting the bare slopes which have been swept by fire. They will probably establish a forest tree seed nursery near Pasadena, in order to set out seedling trees, which they have found to be better than "in place" planting of seed. Much attention is also being directed to the matter of prevention of forest fires.

### **California Irrigation Plans.**

The past few months have been notable for an increased activity in irrigation projects for California, and a number of new ventures have been started, while old companies have been rejuvenated and have entered the field again, better prepared for service than

before. The old Central Canal, the largest venture now on foot in California, has been the scene of a large part of this irrigation renaissance, after the part of the work which had been completed had been lying idle for nine years, owing to litigation. A company has recently been incorporated to carry the work to completion, and the canal when finished will irrigate some 400,000 acres, lying not alone in Glenn and Colusa counties, but also, under plans which have just been formulated, in Yolo and Solano counties. Under this canal is the great Glenn ranch of 40,000 acres, most of which is now being subdivided and sold in lots of from 40 to 160 acres.

The Modesto Canal, in the San Joaquin Valley, is now practically completed, and will make diversified farming possible in a region where great wheat farms depended on natural precipitation. Now the large tracts will become small holdings, and the way will be opened for a larger agricultural population in the great central valley of the state. This canal, with the Woodbridge and Stanislaus canals, will do a great deal toward the development of the interior of California.

Articles of incorporation have been filed at Chico, California, for the Butte County Canal Company, which will irrigate about 20,000 acres of land in Butte and Sutter counties with water taken from the Feather River, near Oroville. The incorporators are J. P. Clark, of Fresno; A. K. Whitton, of San José; D. C. McCallum, of Oroville, and Willard Sheldon, E. A. Bridgeford, C. M. Wooster, and M. S. Sheldon, of San Francisco. Application has already been made and contracts signed for the first water rights under the canal.

Among other irrigation matters of importance to the state at the present time are the changes indicated in the following: The bonded indebtedness of the city of Tulare and about 35,000 acres adjacent to it on account of irrigation water will be settled by a compromise on payment of \$270,000 by September 1. As most of this money has already been secured and deposited for the purpose, the liquidation is assured, and there are already signs of

a reawakening in the district. The Spreckels Company contemplates the installation of a pumping plant and canal system in the Salinas Valley sugar beet district, which will bring under irrigation 5,613 acres of the most fertile land in the valley. This venture is to extend the area in sugar beets, and will depend on the wishes of the land-owners as to whether it will be carried out or not. But as it will provide for a sure crop and for a certain home market for the same, there is no doubt but what it will be put in operation. The water in the Hemet Lake reservoir, which comes from perennial streams in the San Jacinto Mountains, is higher than ever before, and during July was 105 feet deep before serious drains were made on it for irrigation. It is supposed that there will be a large reserve supply left after the irrigation season is over, so that even with an unusually dry year following this, the lands under its canals will not suffer. Heretofore the Hemet Water Company has not had a particularly profitable existence, and it is stated that its receipts were, last year, \$8,000 less than the cost of maintenance. That it is beginning to prove profitable is shown by the fact that the tax assessment on the property has been materially increased.

Lakeview, a Riverside county colony, has developed a fine supply of water from wells which will supply all the needs of the area under the colony's tract, 8,600 acres of which are irrigable. In drilling one of the wells here a cottonwood log was struck at a depth of 144 feet, and shortly before this a number of pine cones were brought to the surface. The rehabilitation of the Bear Valley scheme has already been noted, and the work of organizing the water users' association, which will bring this venture to a successful issue after many years of failure, is progressing smoothly and rapidly. The San José Water Company will construct a big reservoir near Wrights, in the Santa Cruz Mountains, to supply water for domestic and irrigation uses. A large tract of land at Rio Vista, near Suisun, has been bonded by a syndicate which announces its intention of spending \$1,000,000, if neces-

sary, in reclamation, most of it to be in the way of drainage. The soil is marvelously rich, like that on Bouldin Island, which has made the asparagus industry of that place famous.

**Impressions  
of Philippine  
Forestry.**

William A. Dempsey,  
writing to the *Oregon  
Timberman* from Ma-  
nila on lumbering in the

Philippines, makes the following comment on the work of the forestry bureau:

"While in Manila I called upon Capt. George P. Ahern, chief of the forestry bureau, and was much pleased to learn of the work being done under his direction. From him I learned that the insular government, through his department, would grant concessions to cut timber upon payment of royalty, the official in charge selecting such trees as they would allow the logger to cut.

"Captain Ahern is very enthusiastic in his work, and I am sure he would place the records of his department at the disposal of any lumberman desiring information regarding the Philippine forests.

"As it is their intention to perpetuate their forests by supervising the cutting, to that end they will require a corps of trained men who have made forestry a study. At present they feel the need of experts, but this demand will soon be supplied from the American colleges, several of which are training students for this special work.

"Under this system loggers and millmen cannot acquire title to land, and they are prohibited from denuding it of timber. In short, they cannot cut any trees except those bearing the official mark. They might install their logging plants, make roads and landings, and then learn that the amount they could get from a given area would not be sufficient to justify them in operating. I believe, however, that this element of

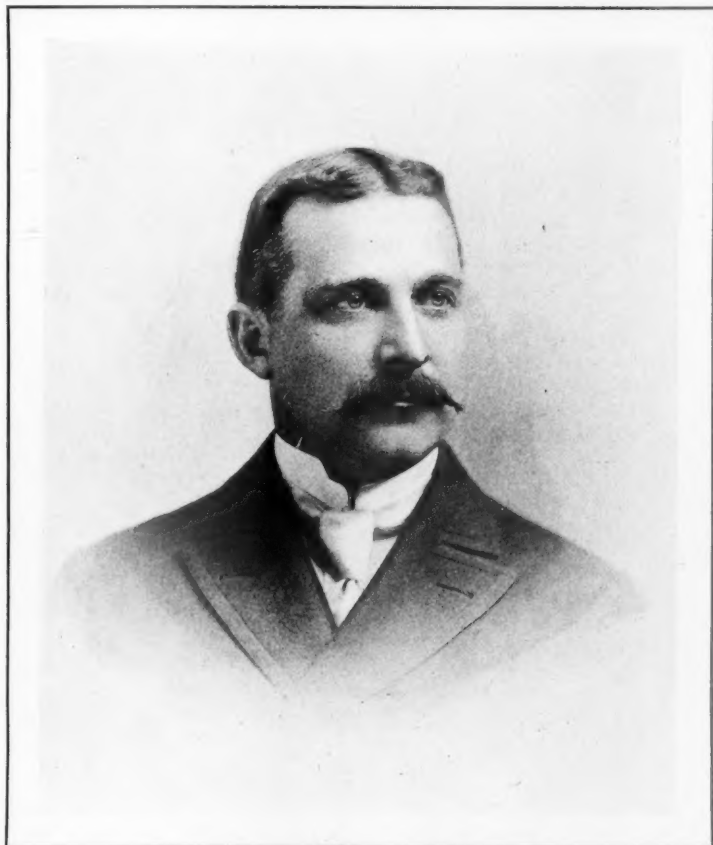
uncertainty will be removed when they have at their disposal enough men and money to enable the bureau to make an accurate survey of the timber lands and to estimate the amount of timber thereon.

"While these restrictions are sure to keep American capital from seeking timber investments in the islands, at least for a time, I am persuaded that they are wise and have for their purpose the conservation of the forest area of the country. This is a matter of great importance, for every agricultural product of the country requires moisture or shade, and the indiscriminate cutting of timber would in time seriously affect the production of hemp, tobacco, copra, and sugar, all of which require a regular supply of rain, and the hemp must have shade as well.

"On the whole, I am convinced of the good work being done by the forestry bureau, and I am informed that its system is so perfected and extensive that they can furnish statistics of the amount of timber cut, and as the timber is classified in groups, they can segregate the total into the quantities of the several varieties, and can readily determine the amount of each variety of wood cut in a province or district. All this information will be of inestimable value to the future lumberman of the islands.

"In connection with the bureau they have a laboratory where tests of Philippine woods are made, and although unable to witness the tests, I was surprised to see the many fine qualities of the wood when brought out by native workmen under the direction of American superintendents. Here were samples of nearly all of the merchantable woods of the archipelago, and the finish given them by Americans showed plainly the possibilities of the woods when they finally reach the markets for which they are adapted."





HON. EDWARD A. BOWERS,

SECRETARY OF THE AMERICAN FORESTRY ASSOCIATION.

**H**ON. EDWARD A. BOWERS, Secretary of the American Forestry Association, who is in charge of the active campaign now being carried on by the organization to extend its membership and influence, is unusually well qualified for this position, both by inclination and experience. He is a native of Connecticut, and received his education at Yale University, graduating from the academic department in 1879 and from the law school in 1881.

Mr. Bowers, in addition to winning marked success as a lawyer, has had an enviable record in the public service. In 1886 he was appointed by the Secretary of the Interior a special inspector in the public land service, in which work he was engaged until 1889, when he resigned. On March 31, 1893, he was appointed Assistant Commissioner of the General Land Office, a position he filled until June 12, 1895, when he resigned, later being appointed Assistant Comptroller of the Treasury.

Mr. Bowers has long been deeply interested in the forest problems of the United States. His connection with the public land service afforded him unusual opportunities for studying the forest questions of the public domain. He has traveled in and studied the forest systems of Europe, and has thus acquired an intimate knowledge of the main features of the subject.

Mr. Bowers has been actively identified with the American Forestry Association since 1889. He was Corresponding Secretary in 1890-'91, and has been a member of the Executive Committee and Board of Directors since 1893. In March of this year Mr. Bowers was elected Secretary of the Association, and is devoting much time and energy in furthering its aims. He is a pleasing and convincing speaker, and with his deep knowledge of and interest in forestry is rendering the Association valuable service. Mr. Bowers' home is in New Haven, Conn., where, in addition to his law work, he is a lecturer in forest administration and law at the Yale Forest School.



## THE AMERICAN FORESTRY ASSOCIATION MEETING.

THE SUMMER SESSION AT MINNEAPOLIS WAS ONE OF THE BEST ATTENDED AND MOST INTERESTING HELD BY THE ASSOCIATION.

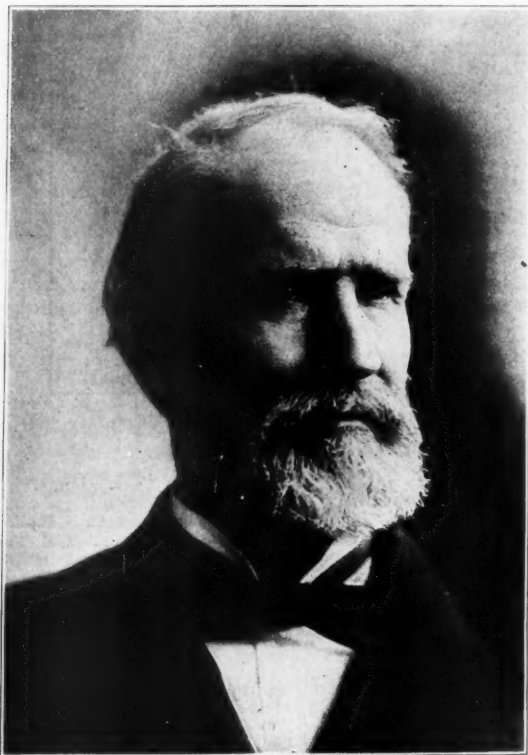
THE American Forestry Association met at Minneapolis August 25-26, and devoted a large part of its sessions to the consideration of forest problems which directly affected the State of Minnesota. Many of the papers provoked warm discussion, and altogether much of value was elicited from the points of view of the various interests represented. The attendance at

the several sessions was large and thoroughly representative. A number of the leading lumbermen of the State were present and took part in the discussions. There was a noticeably large attendance of ladies, many of them members of the Federation of Women's Clubs, who took such an active part in the agitation for a national forest reserve in Minnesota.

Gen. C. C. Andrews, State Fire

Warden, made the address of welcome. Immediately following that came a spirited discussion over the points brought out by a paper on "The Effect of the Chippewa Forest Reserve on the Locality," by Herman H. Chapman, superintendent of the University of Minnesota Experiment Farm at Grand Rapids, in which he stated that lands which grew Jack Pine and Norway Pine were generally unfit for agriculture, being too sandy and requiring too much artificial fertilizing to make them paying farm properties. This discussion was participated in by A. G. Bernard, of Cass Lake; Prof. Filibert Roth, head of the school of forestry of the University of Michigan, and by R. L. McCormick, president of the Mississippi Valley Lumbermen's Association, which organization met in Minneapolis at the time of the American Forestry Association's convention.

W. B. Douglas, Attorney General of Minne-



HON. JAMES WILSON, SECRETARY OF AGRICULTURE AND PRESIDENT OF THE AMERICAN FORESTRY ASSOCIATION. HIS ADDRESS WAS A NOTABLE FEATURE OF THE MINNEAPOLIS MEETING.

sota, presented a paper on "State Parks and Their Relation to Forestry," with special reference to the work which had been done toward reforesting the Itasca State Park, of which he is the custodian. Dr. C. A. Schenck, forester for the Vanderbilt estate at Biltmore, N. C., and director of the Biltmore Forest School, presented a paper on "Financial Results at Biltmore," interesting in its setting forth of the possibilities of private forestry.

The afternoon session of Tuesday, the 25th, began with an address on the "Progress of Forestry in Michigan," by Edwin A. Wildey, member of the Michigan Forestry Commission; this was followed by a paper on "Forestry Courses in Agricultural Colleges," by Prof. S. B. Green, head of the department of horticulture and forestry at the University of Minnesota. Prof. Ernest L. Bruncken, in charge of courses on Forest Law and Forest Economics at the Biltmore Forest School, and formerly a member of the Wisconsin Forestry Commission, read a paper on "Taxation; Its Effect on Private Forestry," in which he advocated some needed reforms.

On Tuesday evening, August 25, the delegates were given a reception at the Commercial Club, among those present being Governor Van Sant and President Northrop, of the University of Minnesota.

The Wednesday morning session was more largely attended than the others on account of the interest which attached to the paper by Eugene S. Bruce, lumberman of the Bureau of Forestry, on the "Work and Policy of the Bureau of Forestry on the Minnesota National Forest Reserve." In this address he told of the difficulties the government had encountered in making the forest



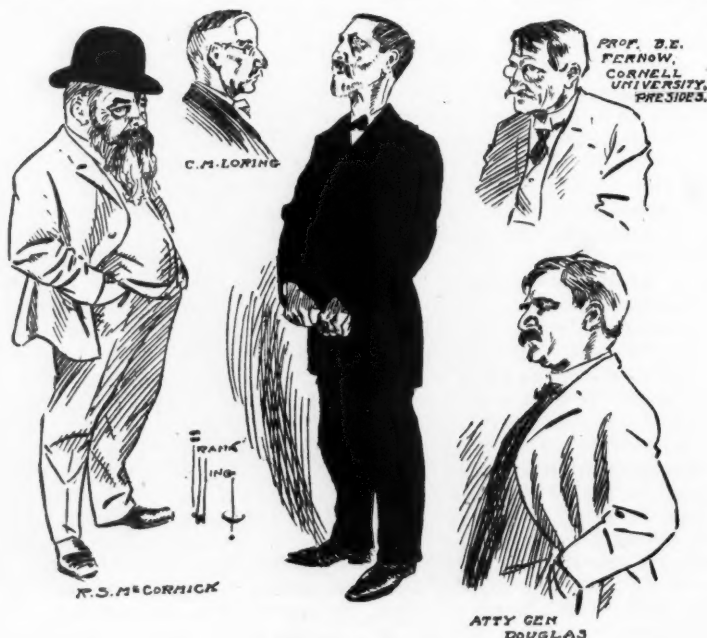
THE BACKWARD BOY: I'VE NEVER HAD MUCH USE FOR SCHOOLMARM'S BEFORE, BUT PERHAPS I SHALL LEARN SOMETHING FROM YOU.—ST. PAUL "PIONEER PRESS."

reservation authorized under the Morris act, and gave a detailed history and description of the reserve. He said that the 5 per cent of merchantable timber to be left on the land was too low a limit, and that 25 per cent would give better results. The paper had a great deal of interest and value, especially to those who were directly interested in lumbering the tract under government contracts. Secretary Wilson attended the session, but declined to preside on the plea that he had come to learn, rather than to direct things. Several miscellaneous matters came up at this time, including an invitation from Chattanooga to hold the next meeting there in order to stimulate the movement for a national Southern Appalachian forest reserve. B. A. Fowler, of Phoenix, Ariz., was appointed a delegate to the National Irrigation Congress to be held at Ogden, Utah, in September. Following this there was a general discussion on the points brought out by Professor Bruncken's paper of the day before, and

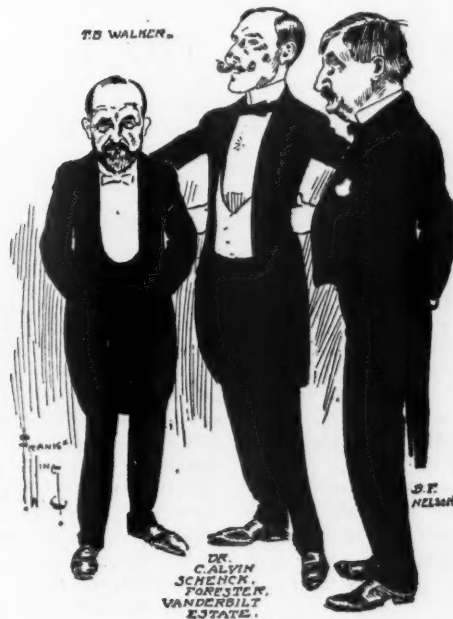
all who spoke, including Dr. Schenck; Dr. Folwell, of the University of Minnesota; George K. Smith, of St. Louis, Secretary of the Southern Lumber Manufacturers' Association, and R. L. McCormick, opposed the whole idea of timber taxation as at present administered. Then followed the paper of B. F. Nelson on "A Lumberman's Idea of Reforestation," and after that T. B. Walker, of Minneapolis, addressed the meeting on "Our Past and Future Forest Policy." As both of these latter addresses were by practical lumbermen, the Wednesday morning session was notable as being given up entirely to the lumber interests in their relation to the forest movement.

The Wednesday afternoon session was marked by several important papers, starting with one by Prof. Filibert Roth, director of the School of Forestry of the University of Michigan, on the "Possibilities of Reforestation in the White Pine Belt." This was followed by an address on "The Future of Our

National Forest Reserves," by Hon. Edward A. Bowers, Secretary of the association. He spoke of the better understanding among the people generally as to the purpose of the forest reserves, particularly in the West, where their situation at the headwaters of important streams gave them value on account of the needs of irrigation. Prof. C. W. Hall, of the University of Minnesota, spoke on the "Geographical Features of Water Control in the Upper Mississippi Valley." Prof. L. H. Pam-mell, of the department of botany of the Iowa State Agricultural and Mechanical College, discussed "Some Forest Conditions in Western Wisconsin," and he was followed by Dr. B. E. Fernow, whose address on "Needs of the Hour" closed the sessions. He said that the principal needs were the realization by legislatures and officials of the immediate seriousness of the forest situation, the establishment of well organized forestry bureaus in all States, and, above all, an efficient fire police.



SKETCHES MADE AT AMERICAN FORESTRY ASSOCIATION MEETING.—FROM MINNEAPOLIS "JOURNAL."



AT THE RECEPTION BY THE COMMERCIAL CLUB; SEVERAL PROMINENT DELEGATES AS THEY APPEARED TO ARTIST FRANK WING OF THE MINNEAPOLIS "JOURNAL."

On the evening of Wednesday, August 26, Secretary Wilson addressed a mass meeting at the Plymouth Church. This address was on the general subject of "Forestry," and designed to give his listeners a correct notion of the work being done by the Bureau of Forestry and by all who are interested in forest extension and preservation.

A gratifying feature of this meeting was the attitude of the press of the "Twin Cities" especially, and of even more remote places. Excellent and

accurate accounts were given by the St. Paul *Pioneer Press*, the Minneapolis *Journal*, *The Times*, the St. Paul *Globe*, *The Despatch*, and others. Many gave important editorial comment, marked not only by a genuine interest in the subjects presented at the meetings, but also by an evident knowledge and conviction on the several points under discussion.

Future issues of FORESTRY AND IRRIGATION will contain addresses delivered at this session.



# FORESTRY ON THE FARM.\*

THE VALUE OF THE FARM WOODLOT AND  
SUGGESTIONS FOR ITS MANAGEMENT.

BY

GIFFORD PINCHOT,

FORESTER, U. S. DEPARTMENT OF AGRICULTURE.

**B**EFORE our ancestors came to this country forestry had already taken an important place in Europe. It was based there entirely on the exclusion of the farmer from all rights in the forest. Forest protection arose purely from game protection, and the farmer was carefully kept out of the forest. He got in that way an extreme respect for the forest and for forest protection; and when the early Pilgrims came over to America they brought with them the tradition of centuries of respect for the forest.

The consequence was that when this handful of people landed on the shore of a continent which they did not know stretched westward for about 3,000 miles, nearly half of which was covered with forest, one of the first things they did was to provide for the protection of trees, for protection to the forest, which in actual fact was one of the severest obstacles with which they had to contend. They began passing laws in Massachusetts, New York, and New Jersey to prevent the cutting of timber which might be used for masts. It was simply a survival of what had come over with them from the other side. Then, as there came a better understanding of their situation, driven into their minds by their contention with the forest for the bare necessities of life, the conception of forestry which until recently held sway practically throughout the United States came gradually into being. The forest was recognized as the enemy of the farmer, and his whole effort for many years was to get rid of enough of it to give him a place to raise his crops.

With that conception of their relation to the forest, the pioneers pressed westward, and they carried with them the American axe, which, so far as I know, is the most effective tool that man has yet devised; and the American axeman-farmer began getting rid of the forest as rapidly as possible. Then came slowly the reaction, the beginning of which we are feeling now, the reaction in favor of forest protection, and the destruction of the forest began to be limited and controlled, partly by the agitation of the forest question, but chiefly by the economic condition of the nation. This question, like many others, has its solution in the economic situation. The situation in early days was that there was more timber in the country than people at the time had any reason to believe they should need. Timber was cheap, and much of it had to be got out of the way to make room for the farm. For that very reason, until just now, it was not worth anybody's while to look to forest protection. The economic situation was not ready for the agitation which was being made in favor of it, and consequently forest preservation interested very few people and had no hold whatever on the great body of the nation. Now we are getting to the place where it is worth men's while to consider whether forest protection is not to the advantage of their pockets.

The essence of forest policy, as we understand it now, the basic principle of it in this or any other country, is the putting of every part of the land to its best use. That conception controls the whole forest policy of the national government. It controls, likewise, the forest

\* From an address delivered before the New York Farmers' Club.



policy of a good many of the large land-holders who are taking up this question, and in some respects most important of all, it should control the policy of the practical farmer on the ground. As a producer, the farmer is vitally interested, necessarily, in this point of view; as consumer, his conception of the matter is a totally different one.

First, then, a word as to the relation of the farmer to the forest as a producer. If it be the policy of the farmer to put every bit of his land to the best use, it must be his policy to make his bit of woodland as productive to him as possible, and usually in one of two ways—either by giving him his material for fence posts, building materials, and cordwood, or by yielding its money equivalent. The farmer, as a rule, is not interested in his woodlot as capital; he does not care especially what the interest on his capital thus invested amounts to (that is for the lumber company); the farmer thinks that his woodlot must either give him as much usable material as possible or the largest return in dollars and cents. He takes up the question usually from the point of view of immediate profit, and he begins to cut his woodlot in order to get from it what he most immediately needs, and usually that is his cordwood, his fence posts, and timber for his house or his barn. He goes at it generally in the wrong way, because the material he needs is usually the best material on the ground. The farmer wants straight timber, his wife wants clean split stuff for the stove, and he himself wants rails that will split easily. So he takes the best there is. The result is shown over thousands of square miles in woodlots producing a very small fraction of what they might easily yield.

It is one of the most difficult things to give more than general directions for handling woodlots unless you go on the ground and see what they need. The forester who attempts to give advice as to handling any tract that has been cut over in this way has a piece of work on hand very much like that of a doctor, and he is constantly obliged to compromise with the things he would like to do, because of mistakes already made.

There are, however, certain general directions which may be very briefly touched upon.

The first is, in cutting out your woodlot, take the bad trees and the trees of the kinds that you do not want reproduced. The composition of any piece of forest is necessarily determined by the seed trees which produce the trees from which it grew. It is perfectly obvious that if you want White Oaks in your woodlot, you must leave the White Oaks and cut out the other trees. The selection of the best and most useful species by the farmer has led to very serious deterioration in the character of the woodlots over the eastern parts of the United States. As I came across by rail from San Francisco a little while ago, I was immensely struck by the wretched condition of the woodlots along the line of the railroad. Everywhere the best timber had been cut. The wood had been taken out almost entirely without regard to the future crop, and, as the leaves were off, I could see the extremely poor and unproductive condition of a great majority of the woodlots along the road. This matter is of enormous importance, because between *one-third and one-half of the forests of the United States is in the hands of farmers*, and depends for its preservation and right treatment on the point of view that the practical farmer takes of the handling of his woodlot.

Having stated these obvious things about selection of species, the next thing is the choice of the individual trees. Pay no attention whatever to the distribution of the trunks on the ground. It makes no difference that the intervals between the trunks of the trees are unequal. A tree's health is almost entirely determined by the crown, and that is the place to look in deciding what trees to take and what to leave, remembering always that the more valuable kinds of trees are to be left for seed and the unsound trees taken out everywhere. The place to look is at the crown. Select your trees so that what remain will be so spaced that each one will have the best possible amount of growing space.

In a growing forest it is not less un-

fortunate for the trees to stand too far apart than too close together. What is wanted is a healthy stand of the most valuable kind of timber, and for that we must have tall, straight trees, with trunk clear of branches far above the ground. They must have room enough, but not too much room. I make this point strongly, because I find in dealing with men on the ground that their first idea, as a rule, is to thin out, and generally to thin out far too strongly. In that way danger lies. Give your trees sufficient growing space, but be careful not to give them too much. If you admit too much light to the ground, so that it dries out and the grass starts, it becomes difficult for the young seedlings to gain a footing. You must keep the soil moist and loose and in condition for a good seed bed, and to that end keep the forest dense.

There are two kinds of cutting which the farmer is called upon to do. The first, of which I have already spoken, is thinning in order to give the trees which form the future crop the best chance for satisfactory growth. In my experience, it has been a most useful rule, as it is a very safe one, to ask yourself this question: What are the trees that are to form the future crop in this forest? In very many cases you will find yourself led in this way to take out old trees of large size which otherwise would seem naturally indicated to remain, because after considering you find that the majority of the crop is composed of younger trees. If the old trees were permitted to stand, they would inevitably shade out the younger ones beneath them, and you would have a lot of slim poles growing up between old useless trees with spreading crowns. The Germans call these overbearing trees "wolves" in their forest terminology, because they bear down and destroy the little ones. They shut out from the light the young trees which would otherwise come out and in due time make valuable timber. This, to my mind, is a point of very great importance.

When you come to the second kind of cutting, which is the final cutting, when you take out the old trees under which

there is young growth, or where you expect young growth will shortly be, you will find many different methods open to your choice. The one essential thing to remember is that your object in taking out the old trees must be not only to harvest them, but to get a young crop. Just as soon as that conception is born among the farmers and lumbermen of this country, the forests will be safe, but until that time there can be no assurance of safety. That is the kernel of the whole business: you must provide for a second crop.

You will have noticed, in talking with farmers on the ground and with the managers of your own farms, that young trees less than 10 or 12 feet in height apparently do not exist for them. I have had lumbermen tell me over and over again that certain trees, as, for example, Yellow Poplar, never reproduce themselves. I have taken the men who made these statements into the forest, and have shown them quantities of young growth of the trees which they say never reproduce themselves. The lack is not of young trees, but of the habit of taking them into account. A young tree of three or four years' growth may be as important for the future of the forest as one 20 feet high. Therefore, in cutting out the old trees, save every little seedling that you possibly can, and throw the old timber in such a way as to break down as little as possible of the young growth. Every sound tree can be thrown at least three ways, and the chopper soon gets into the habit of taking damage to young growth into account when he gets ready to fell the tree. It is astonishing how difficult it is to get men to take slight precautions at the beginning, and yet how easily they fall into the practice of them after a little.

I am reminded in that connection of the experience of the Bureau of Forestry with an important timber tract in the Adirondacks belonging to a member of this club. After careful study on the ground, the Bureau laid down certain rules for the cutting of Spruce. These rules were discussed and revised with the owner and the lumberman, and with the jobbers who were to do the work. Be-

cause the matter was in the hands of a practical lumberman, the rules were applied by the jobbers without any increase whatever in price, which means that the cost of the logging to the owner over ordinary methods was nothing at all. Forest destruction in logging is often a matter of habit of mind. As soon as the logger falls into the way of saving young growth, he does it as a natural consequence of his work, without thought and practically without greater cost of time or effort than his work demanded before.

One of the most effective methods of forest reproduction for the use of the farmer is technically called the Group System. Like the rest of forestry, it is simply an application of the methods which we learn from Nature herself. You have all seen over and over again where a single tree or half a dozen trees together have fallen in the forest from wind or some other cause, and have left an opening which has come to be filled with young growth. The tallest and most vigorous trees will be in the middle of the opening and the smaller ones under the denser shade of the sides. All that is necessary to extend the reproduction in such a case is to cut away the old trees at the sides of the hole. If you need timber faster than

a single opening will produce it, make others. Then, as the young growth spreads, these holes will spread, and gradually you will find the whole surface of the ground has been occupied by young growth, which, spreading like a series of spots of oil on the surface of the water, gradually meet. Then your reproduction is complete, and the forest cover has never been seriously broken. This is perhaps the simplest of what we call the silvicultural systems, and the one decidedly the best adapted for the woodland of the farmer. Nothing more need be said of it except to make the openings comparatively small, not more than twice the height of the trees, to work up the trunk and the top immediately after they are down, and to let the young growth spread gradually year after year until the openings run together. Young trees that have been crushed from the fall of an older tree, if released at once, spring up and make good timber, but they may be permanently ruined if they are pressed down for three or four days.

Such work as this is simply and easily carried out, and with these simple precautions leads, wherever the reproduction is good, and that is nearly everywhere throughout the humid regions of the United States, safely and inevitably to the preservation of the forest.

## PRACTICAL IRRIGATION A SUCCESS IN FLORIDA.

FACTS AND STATISTICS CONCERNING THE  
RECENT DEVELOPMENT OF A MOST IMPOR-  
TANT PART OF THE STATE'S NATURAL WEALTH.

THE adoption of extensive irrigation enterprises in Florida came as a natural result from several fundamental causes, chief among which is the fact that in Florida irrigation can be applied to a relatively larger area than in any other state in the Union. Practically the entire surface of the state is level, nowhere reaching an altitude of 500 feet, and, in addition to this, the water supply is readily available and inexhaustible. The state's total area is

58,680 square miles, of which 4,440 square miles, or 8 per cent, is water, making the state first in the extent of its water surface. Aside from the surface waters of lakes and streams, there appears to be a great artesian basin near the coast line extending entirely around the state and to areas adjacent to tidal rivers and large lakes. On the ridges or higher lands in the central part the wells do not have a surface flow, but afford an abundant supply of

water when pumped. Although the state has a heavy mean annual rainfall, it is subject to severe drouths during the growing period between February and June. The soil is naturally non-retentive of moisture, and owing to the great heat, evaporation is excessive. During the dry seasons the need of irrigation is imperative, especially as the products of the truck farms and groves are of great commercial value, rendering even a partial loss of crops very costly.

In general, the lands of Florida may be classified as hammock, high pine, flat wood, and swamp. The hammock land is covered with Live Oak, Hickory, Cedar, Palm, and Magnolia. When cleared it is the most fertile, and is usually planted in truck. High pine land is favorable for horticulture, but as the soil is thin, heavy fertilization is required. The flat woods are largely given to grazing, although in some sections they have been found well suited to the growing of potatoes. The swamps when drained are peculiarly adapted to the cultivation of rice and sugar.

The history of irrigation and intensive farming in Florida dates from the two severe successive frosts of the winter 1894-'95, which destroyed nearly all of the large orange groves of the state. Previous to that time irrigation was confined to an occasional watering of orange groves during the periods of spring drouth. Many of these irrigation systems were large and expensive, consisting of engines, pumps, reservoirs, and iron pipes. After the frost they were abandoned, and for several years were left to rust and decay.

About this time truck farming began to assume considerable proportions, and a number of orchardists turned their attention to this industry. In the first experiments with irrigation in the growing of early vegetables the old engines and pumps were utilized, many of them by the orchardists themselves, who were forced by circumstances to engage in the industry. A majority of these old plants, however, were secured for little or nothing by small farmers and transferred by them to other parts of the state. The first trial of irrigation gave a hint of the possibilities of intensive

agriculture, and created an active demand for the old machinery in all parts of the state. With a better knowledge of the soil, fertilizer, and water requirements of certain vegetables came improved yields and greater profits, and irrigation and truck farming began to extend all over the state. The results have been so generally satisfactory that much interest and enthusiasm on the subject have been aroused among the progressive farmers and among those interested in farm investments in the state.

In comparison with the soil of western states, that of Florida is very poor. Successful farming requires large quantities of fertilizer and frequent and careful cultivation. It is therefore somewhat remarkable to find a state which has been thought to require the importation of a soil before it could produce a crop holding such a prominent place in the truck-producing region. While Florida contains extensive phosphate beds, very little, if any, of this valuable fertilizer is used within her borders, nearly all that is mined being shipped outside of the state. The principal commercial fertilizer used comes from the large packing-houses and from manufacturers of fertilizer in other states.

The Florida truck farmer enjoys a distinct advantage in being able to plant in September and to place the products of his fields on the northern markets when there is no competition and when prices are highest. He harvests in January, February, March, and April, and is practically through with his crops before the truck from other states is ready for shipment. Intensive cultivation of small areas therefore brings greater profits than are derived from large tracts devoted to the same crops in other states, and instances are common where with careful irrigation 5 or 10 acres yield a comfortable living with but a few months' work. Intensive agriculture when combined with irrigation tends to promote the growth of small, compact communities, affording the farmers a greater degree of social enjoyment, better schools, and numerous other advantages which are unusual in ordinary farming communities.

FIELD OF IRRIGATED STRING BEANS, SANFORD, FLORIDA.





The districts in which irrigation is practiced are widely scattered. Commencing in the extreme northwestern portion, they extend through the central part, with numerous areas on the east and Gulf coasts. In northwest Florida irrigation is applied in the growing of Sumatra tobacco, while in other sections it is utilized in the cultivation of truck and small fruit farms, orange groves, pineries, and nurseries. The water for irrigation is obtained from streams, lakes, and non-flowing wells, by various pumping devices, or from artesian wells having a strong surface flow.

#### IRRIGATION SYSTEMS.

*Pumping Plants.*—Florida's streams, while large and of great volume, have little fall, and irrigation by gravity ditches is not practicable. Hence the water from the streams and lakes is pumped into reservoirs on the higher lands and thence diverted to the fields. The expense of installing and operating a plant is the only limitation upon the growth of irrigation, but the initial outlay is so great as to prohibit its application to any except special crops which yield the largest returns.

The pumping plants are reported chiefly from the vicinity of Quincy, in Gadsden county, where Sumatra wrapper tobacco is grown, and from Gainesville, in Alachua county; but others are scattered throughout the state. The systems in Gadsden county are the largest and most expensive in the state. The water for these plantations is pumped from creeks and rivers to reservoirs, sometimes 120 feet above and nearly a mile distant from the streams. These reservoirs are cement lined and hold from 500,000 to 2,000,000 gallons. The capacities of the pumps range from forty to sixty thousand gallons per hour. In some cases the water is pumped directly into troughs and led upon the fields, while in others the elevation of the fields necessitates two lifts and two reservoirs. On one of the plantations two turbine wheels are used, one of 45-horse power coupled direct to two triplex pumps. One pump delivers water 1,500 feet west of the river to fields 40 feet higher. The other delivers

water 4,200 feet to a reservoir 50 feet above the stream.

At Gainesville the pumping plants are used in the irrigation of truck, principally lettuce and cucumbers. The water is pumped direct to the fields in iron pipes and applied by means of hydrants and hose connecting with the main supply pipe, or by overhead sprays arranged on stand-pipes in various parts of the fields.

Many of these pumping plants are in operation in other parts of the state, but are used mostly in the orange groves. Irrigation is keeping pace with the rapid increase in the areas devoted to this fruit, as it has been found of great value in promoting the growth and health of the trees during the dry season.

*Artesian Wells.*—The artesian basin of Florida, which is now being developed by wells, is already a very important factor in intensive agriculture. The great extent of the basin and the accessibility of its waters presage a much greater utilization of this method of irrigation in the future.

The water horizons vary somewhat, but are nowhere at great depth, flowing wells being obtained by borings from 20 to 500 feet. Many of the deeper wells reported are on the Island of Terra Ceia on the Gulf coast, and in Brevard county on the east coast. The greatest variations in the horizons are noted in the Gulf coast area. Nearly 100 wells are reported from Hillsboro county, most of them in or near Tampa. These wells are from 25 to 120 feet deep and have a comparatively strong flow. In Manatee county, and particularly on the Island of Terra Ceia, 60 miles south of Tampa, the wells have depths of from 240 to 500 feet.

A large number of wells are reported from Orange county with depths varying from 80 to 200 feet. In this county, a considerable area near Sanford, on the St. Johns River, has been developed by these wells. This district affords one of the best concrete illustrations of the results of irrigation in connection with the cultivation of garden crops, which in the neighborhood of this place has become the principal industry of the people.

The greatest utilization of artesian water within a given area is on the Island of Terra Ceia, where the individual areas under cultivation are small, ranging from 5 to 30 acres. The wells on the island have a strong surface flow, and show no diminution in volume after several years' continuous use. A 3-inch artesian well, costing about \$350, frequently will irrigate 10 acres. At Sanford the capacity of the average artesian well is 5 acres, and the cost varies from \$60 to \$125 for 3 and 4 inch wells. At Hastings, St. Johns county, a 4-inch

artesian waters of the state contain sulphur in considerable quantities, the cause of failure may lie elsewhere. Experienced irrigators ascribe the lack of success in east Florida to excessive flooding and failure to cultivate the land immediately after irrigating and not to injurious mineral ingredients in the water. It seems probable, therefore, that, with further study and experiment with reference to crops, soil, and the quantity of water required, irrigation may prove as successful in the east coast region as elsewhere.



FIELD OF IRRIGATED LETTUCE, SANFORD, FLORIDA.

flowing well affords sufficient water for the irrigation of 10 acres or more. One well is reported to have irrigated 45 acres.

Considering that successful irrigation requires skill and experience, the failures reported in Florida are very few. The greatest number of unsuccessful attempts to irrigate from artesian wells are reported from the east coast region, where irrigation has not made the same progress as in other sections of the state. The reason commonly ascribed by irrigators for these failures is that the artesian waters are strongly impregnated with sulphur and have proven injurious to plant growth. Inasmuch as all the

#### METHODS OF IRRIGATION.

*Irrigation by Pumps.*—The most elaborate irrigation systems in the state are employed in the vicinity of Quincy, Gadsden county, in the growing of Sumatra tobacco. The Sumatra plant requires special soil, cultivation, and irrigation to bring it to perfection, and the present success of the planters has been attained only after the most careful study of the plant's needs, and long and frequent experimenting with soil, fertilizers, and irrigation.

The best grade of Sumatra requires protection from the direct rays of the sun; hence these large plantations are

covered with framework, over which millions of yards of cheese cloth are stretched or miles of narrow slats are laid. The soil must be prepared with the utmost care, and 26 wagon loads of stable manure and  $1\frac{1}{2}$  tons of cottonseed meal per acre are thoroughly mixed with it. The plants are grown from the seed, which is usually planted in small clearings in a swamp and under cheese cloth. As soon as they reach the size of young cabbage plants they are transplanted, and are set about 14 inches apart in rows 2 feet apart. From 10 to 14 thousand plants are set to the acre. Many of the fields are equipped with overhead pipe lines, with sprays every 33 feet, the water being applied in the evening.

Where overhead irrigation is not practiced, the fields are divided at regular intervals by wide wooden troughs. These troughs are supplied from reservoirs above the field, or from pipes directly connected with pumping plants on the streams. As soon as the plants are firmly set a "scooter" is run between the rows, throwing up a flat-bottom furrow, through which the water is directed from the troughs.

In the overhead system, now recognized as the most perfect and satisfactory method of artificial watering, 2-inch pipes are run over the frames in parallel lines about 40 feet apart and extending all over the fields. At intervals of 40 feet a small iron pipe, the upper end of which is closed with a spraying attachment, extends upward about 4 feet above the shades. When the water is turned on it comes out of the sprayer in a fine mist and falls like a gentle rain upon the plants. Tobacco grows extremely fast, in some instances attaining 9 feet in 37 days, necessitating support for the plants. A fair yield of Sumatra tobacco in Gadsden county is 1,000 pounds to the acre, although it frequently runs as high as 1,500 pounds.

The industry requires the investment of large capital, gives employment to a small army of colored laborers, and has become a strong factor in the material development of Gadsden county. At present all the irrigated plantations are controlled by people from the North.

In the vicinity of Gainesville, where lettuce and cucumbers are the leading products of the truck farms, scientific methods are employed to bring the crop to early maturity. The lettuce is planted in thoroughly moistened seed beds, protected by canvas stretched over frames, and the irrigation in nearly all cases is by means of sprays from overhead standpipes. In some cases the sprays are affixed to the ends of movable pipes, which are turned first to one side and then the other, one spray covering 20 feet each way. Along the north and west sides of the beds large steam pipes are laid as a protection against cold nights and to force the growth of the plants. As soon as the lettuce has a good start it is heavily irrigated every day. As the lettuce is marketed, cucumber plants are set between the rows, so that when one crop is over another is well along.

Orange groves are irrigated in various ways. One irrigator in Brevard county uses a No. 6 hydraulic ram in a small stream on his place. The stream has a fall of 6 feet, and the ram lifts the water through a 2-inch pipe to a reservoir 37 feet above and 400 feet from the stream. From the reservoir the water is carried in iron pipes by gravity to a 6-acre orange grove, a small pinery, and garden. Irrigation is by hose attached to hydrant connection on main pipes. The expense of operation amounts to very little, and the plant has been a success for several years. Some of the largest groves are piped throughout with cement pipes connected with 2-inch hydrants, to which the hose is attached. In others the water is carried to the trees by means of furrows. Trees which are irrigated are said to better hold the fruit, which does not split when the rains set in.

*Irrigation from Artesian Wells.*—The largest areas in truck irrigated by artesian wells are in the hammock lands, the soil of which is black, light, and largely composed of vegetable mold, though seldom very deep. Irrigation has been successful in several sections of pine lands, though these are not, as a rule, as rich as the hard-wood hammocks. The initial outlay for irrigation by wells is large, as the land must be cleared, leveled, and ditched before it

is ready for putting in the tiling and iron pipes. Several systems are employed in irrigating the fields. One in common use is as follows: Continuous underground cement pipes are laid from the wells to hydrants, plugs, or stand-pipes, from which the water is distributed in small furrows between the rows. These pipes are made and laid by the same machine, in trenches previously prepared, and extend without a break to any desired part of the field. The pipe itself is composed of two parts sand and one part cement, with the usual

it is possible to irrigate one acre and leave all the surrounding acres dry. Drainage is managed in the same way and through the same pipes, by cutting off the flow of the wells and removing the plugs or cut-offs.

Irrigation in the vicinity of Tampa is largely by underground drains of wood, the water being run from the wells through pipes into ditches which are connected with V-shaped drains running at right angles. By closing or opening these drains at the lower end the land is irrigated or drained at will.



IRRIGATED CELERY FARM OF A. ROBBINS, SANFORD, FLORIDA.

inside measurement of 3 inches and an outside measurement of 6 inches, and costs about 8 cents per linear foot.

In one of the systems of sub-irrigation the water is carried through pipes 14 inches below the surface, broken every 10 inches and laid in beds of charcoal. The lines of pipe are laid every 20 feet. These pipes run east and west and are crossed every 280 feet by 4-inch water-tight supply pipes. At the junction of these pipes is a brick and cement box or pocket, into which all pipes empty. The bottom of this box is 21 inches below the surface, and the flow of the water is regulated by a system of plugs or cut-offs. Under this system

One irrigator near Oviedo reports the use of artesian water primarily for the purpose of warming a covered nursery. He has hydrants 4 feet apart each way and irrigates with sprays. During the coldest night of 1902, when the thermometer registered 18° F. for several hours, the temperature in this shed did not go below 48° or 50° at any time. The hydrants are used also to irrigate the ground, both methods of irrigation being found necessary there, owing to the remarkable porosity of the soil. It is said that a stream of water might play all day on one square yard without adding perceptibly to the moisture of any of the rest of the ground.

The temperature of the artesian water is about 72° F., and advantage is taken of this by numerous irrigators on Terra Ceia island. The artesian flow is turned on the north side of the cucumber fields, and has been found to protect them from frost for some distance.

#### GENERAL STATISTICS.

Among the humid states where irrigation is practiced for general crops, Florida continues to hold first place in the number of irrigators, amount invested in irrigation systems, acreage irrigated, and total value and average value per acre of irrigated crops.

In 1902 irrigation was reported from 405 farms, the irrigated area being 3,772 acres and the irrigation systems representing a constructive outlay of \$512,859. The total artificially watered area producing crops was 3,313 acres and the value of the crops grown thereon was \$1,432,530, an average of \$432 per acre. The irrigation systems cost \$446,569, an average of \$135 per acre. There were 56 farms, having an irrigated area of 459 acres, which did not produce crops in 1902, the land being in young orange trees. The cost of constructing irrigation systems supplying these farms was \$66,290. There were also reported 25 irrigation plants, costing \$26,658, that were not operated in 1902.

The highest average value per acre of irrigated products is reported from Manatee county, the irrigation being by windmill, steam pump, and hydraulic ram. One of these systems is employed in the irrigation to two acres of pot

plants and nursery stock, which are sold mainly to owners of conservatories in the North. The value of the products in 1902 is reported as \$30,000, or \$15,000 per acre.

The lowest average first cost of irrigation per acre is reported from Saint John county. This is partly due to the large volume of the wells and to the simple methods employed in applying the water to potatoes, the principal crop irrigated. The comparatively high average first cost of irrigation in Orange county is due to the expensive system of tiling employed in applying the water and draining the land. In Manatee county, where the system of tiling for irrigation and drainage is also very complete, the wells have a stronger flow and greater pressure, and supply larger areas, thus reducing the initial outlay per acre for irrigation.

In view of the very large increase in the use of irrigation in the cultivation of general crops and the success which seems to have uniformly followed its application, a very much greater development in the trucking industry is to be expected.

In nearly every section of the state possessing favorable transportation facilities, the first experiments with irrigated truck have resulted in a steady increase in the acreage thus cultivated.

The information contained in the foregoing article is contained in a report prepared by Clarence J. Blanchard for the Census Bureau, and is based upon information obtained by correspondence and work in the field.

## THE HOMEMAKER OR THE SPECULATOR?

A STRONG NOTE OF WARNING ON THE DISPOSAL OF THE REMAINING PUBLIC LANDS.

BY

WILLIAM E. SMYTHE.

**S**HALL the nation's great domain of western arid lands and the nation's money be used to enrich a comparatively few greedy individuals, or shall they be

used to furnish security and happiness for millions of men, women, and children?

Uncle Sam is still rich enough to give



us all a farm, and an irrigated farm at that. It is not a dream, but a fact, that the present population of the United States can be duplicated on the arid public domain in the West.

This can be done without making new competitors for those already engaged in agricultural pursuits in the east and in the south. On the other hand, this wonderful act of planting a new nation in what is now all but an unbroken wilderness will confer enormous benefits on those sections which are already covered with farms, factories, and towns.

The subjugation and settlement of the great empire of public lands means that every factory wheel in the United States must whirl faster, that every banking house must handle more money, and that every railroad must transport more passengers and freight. This, in turn, means a larger and busier population in every eastern and southern town, and that, of course, will quicken and enlarge the demand for all the products of the soil in the older sections of the country.

In the meantime, that which is grown from the soil to be conquered by irrigation in the West will go almost exclusively to the feeding of new home markets to be created within the arid region itself and to the satisfaction of unlimited demands in the Orient and in the frozen north.

Congress has decreed that the great policy of national irrigation shall be entered upon without delay. Already the engineers and surveyors are doing their work, and five great projects have been reported favorably to the Interior Department. Only about \$7,000,000 are required to carry all five to completion, and the money is in the Treasury awaiting the call. But upon the threshold of the greatest constructive policy to which this nation ever set its hand a new and appalling obstacle is encountered.

Almost every acre of these lands which the nation is about to prepare for the swarming of a home-building population may, under existing laws, be stolen and used as the basis of a profitable speculation. And those who desire to secure these lands for speculative purposes are strong enough to tie the hands of Congress until the deed shall have been done. This, too, in spite of the fact that the President of the United States has urged the repeal of these iniquitous land laws as something which is vital to the success of the national irrigation policy.



A BIT OF DESERT LAND BEFORE THE APPLICATION OF WATER.

Shall the nation's land, then, and the nation's money be used to enrich a comparatively few greedy individuals, or shall they be used to furnish security and happiness for millions of men, women, and children?

This is the question which must be answered when Congress meets again. The answer depends absolutely upon the will of the people as it shall be made known to their representatives at Washington. No power on earth except the power of an aroused and indignant public opinion can save the arid region from falling prey to the speculators who are alive to their opportunity while the people are asleep.

In his last message the President recommended the repeal of the desert-land law, of the commutation clause of the homestead law, and of the timber and stone act. These are the provisions of existing statutes under which absolutely the most valuable property now owned by the American people is being systematically absorbed into private ownership by those who cannot use it, but who propose to sell it at enormous profit to real home-seekers when the nation shall have multiplied its value an hundred fold by means of irrigation.

The nation has land for every man who will make his home upon it in good faith—who will break the sod, plant crops, build a house, and settle down to support his family from the soil; but the nation has no land—at least it ought to have none—for the man who merely seeks to forestall the actual settler and sell out to him at a profit or become a landlord collecting income from his tenants.

Under the present land laws millions of acres are being taken by those who have no thought of breaking the soil, planting crops, or building homes. They are mere adventurers and speculators.

The desert-land law gives them a chance to obtain for a song, without residence and without cultivation, 320 acres of the richest soil on earth—enough for sixteen families. The commutation clause of the homestead law gives them a chance to take up 160 acres with but the barest pretense of residence, and that for only fourteen months. The timber and stone act enables them to acquire forests and quarries for a bagatelle, and to hold them for speculative advances.

Frank Stockton left the hero of his famous tale hesitating before two doors. If he opened one it meant life and happiness, if the other death; and the question was never answered—"The Lady or the Tiger?"

Uncle Sam stands at the door of the arid region. His foot is on the threshold, his hand is on the latch.

Shall it be the home-maker or the speculator? Shall it be life and happiness for millions or a riot and a carnival

of speculation at the expense of the people. There is but one way to answer the question in the interest of the nation's welfare—that is to repeal the existing land laws in accordance with the President's recommendation.

#### IRELAND'S GREAT LESSON FOR AMERICA.

Two very big things have already happened in the brief history of the twentieth century. Each of these things makes for the greater economic freedom of the race; each represents a lofty conception of statesmanship. Both were undertaken by English-speaking peoples—the one by Great Britain, the other by the United States; the one the presentation to the English Parliament of the Wyndham bill for the restoration of the land to millions of people in Ireland, the other the passage, a year ago, of the National Irrigation Act, which aims to make homes for millions of people in the arid region of the West.

Between these two great measures there is a singular analogy. Both of them deal with the foundation principles of civilization. They aim to give man a secure foothold on the soil; they aim to put him in possession of the primal means of existence; they recognize his right to participate in the ownership of natural wealth.

The event in Ireland marks the last gasp of dying feudalism. The event in America marks the entrance upon a new and momentous stage of that policy of material conquest over new areas which is the real secret of prosperity and greatness of the Republic. Both events do infinite credit to the governments which brought them about, and both are hopeful signs of the tendency of the times.

But those who are familiar with what is going on in the west, strange as it may seem, look with a certain envy on Ireland. She is dealing with a problem almost identical with our own. The only difference is the difference between rebuilding an old house and building a new one; but she has learned a lesson which we must learn in order to realize the full benefit of the policy on which we have entered. This lesson is that

there is no peril to the peace of a country like the peril of land monopoly.

Land monopoly robs men of a large portion of the products of their labor. It nullifies the spirit of constitutional guarantees which seek to give assurance of political freedom. No man is free in the true sense of the term who is beholden to another for the means of his existence, and land monopoly makes rebels instead of patriots. In the case of Ireland it drove more than half the population away from the native soil. It filled their hearts with bitterness, and even sent some of her children into the ranks of England's enemies in the hour when her life was at stake.

On the other hand, it is a well recognized truth that no nation can have a better bulwark than millions of men who own their own homes. It has been well said that "no man ever went to war in defense of his boarding-house."

All these things are familiar enough to thoughtful people. Why say them again? For this reason: the crushing burden which Ireland is now preparing to slip from her shoulders the American people are proceeding, by means of a subtle and silent process, to take upon their own. There is danger, very grave danger, that one of the most beneficent acts of national legislation ever framed and passed may miscarry; that instead of making homes for millions of small proprietors, we shall make vast stock ranches and lordly private estates for a comparatively few great proprietors.

#### AN ENTRANCING VISION.

The scheme for the reclamation of the arid public domain undoubtedly delights the imagination of the American peo-

ple—the making of something out of nothing, the creation of a multitude of homes where the desert now exists. Gratifying evidence of the fact is found on every hand; but there is another side to the matter. How many people know anything about the details of the undertaking? How many actually appreciate the value of the imperial domain of the west which is still the property of the United States? Probably not more than one in ten thousand. And of those who do, a considerable proportion belong to the class of speculators and adventurers



SCENE SHOWING THE RESULT OF IRRIGATION.

who know too well how to acquire valuable parts of this property for themselves and who are proceeding to do so with startling rapidity in all sections of the West.

Some day the full story of the looting of the people's heritage will be told. When it is, the average American citizen will open his eyes with amazement; and he will pass from amazement to indignation. The question is, Will he do so in time to avail anything, or will he only lock the door after the horse is stolen?

## A DANGEROUS COMBINATION.

The present system of disposing of the public lands is the product of two kinds of statesmen—those who knew too much and those who knew too little. Selfish enlightenment and unselfish ignorance make a dangerous team; and this is the team which has been whirling the American people to the edge of the precipice of land monopoly.

There are strong influences in the West which want laws that make it easy for the land to be stolen. Stealing is a hard word. Let us call it kleptomania. Then there are strong influences in the East which have been so busy puttering over tariff and currency problems as to leave no time to become acquainted with far greater issues which actively involve the economic liberties of the people.

## IRELAND'S WOES A WARNING.

There stands Ireland, emerging after

centuries of bitter and heart-breaking strife from the toils of land monopoly; and there stands the great West, marching steadily into the same hateful toils. It is costing the English Government over half a billion dollars to get out of the predicament which the American people are now getting into at an appalling rate. Over 2,000,000 acres of land are going to the speculators every month, or over 24,000,000 acres every year.

What will it cost us to stop the crime before it is too late? The price of this deliverance is an irresistible public demand for the repeal of the existing land laws. When this has rolled in upon Congress from all parts of the country, Congress will act in response to the recommendations of the President's message. Until then there is no hope that it will act. The American people should remember Ireland's experience.

## THE PINE LANDS OF THE SOUTH.

POSSIBILITIES OF FOREST GROWTH IN THE SOUTHERN ATLANTIC COAST STATES AND THE NECESSITY FOR ADEQUATE PROTECTION TO MAKE PROFITABLE LUMBERING.

BY

H. C. PUTNAM.

AFTER a thorough investigation of the forests of North and South Carolina and Florida, and particularly in those localities where pine woods have grown up on plantations which were once cultivated, I have been most forcibly convinced of the possibilities to follow forestation in many localities. I am firm in the conviction that state or national influences should be exerted in the formation of one or more forest reserves in this region, if only for the purpose of forming an object-lesson to the people of the southeastern states. In arriving at the conclusions expressed in this paper I got all my information at first hand and spent three months during the past winter in the states mentioned, most of the time in the pine forest or in

the cypress swamps. I visited all of the lumber camps that I could, and spent sufficient time at each to get the details of the business.

Having been for the past 45 years in touch with forest and lumbering operations in Wisconsin, and entirely familiar with the details of measuring and estimating standing timber, I feel fairly well qualified to speak on what I saw of the conditions during these three months in the Carolinas and Florida. Moreover, I have been familiar with the timber interests of the South for the past 10 years. A half century ago, in 1854-'5, I was a civil engineer and was much in its forests and saw many of them in their virgin state, as but little had been cut at that time. Ten years ago I again



SCENE IN A TYPICAL LONGLEAF PINE FOREST.



visited most of the sawmills in the states named, so I feel competent to judge of present and past conditions.

In all this time I have noted many changes in conditions. Only a few of the sawmills in the South were making money in the manufacture of lumber ten years ago. At that time, the North-west—Michigan, Wisconsin, and Minnesota—was cutting eight to ten billion feet of lumber a year; Maine and New Hampshire produced 500,000,000, and a small amount of lumber from the small sawmills of the South was sold in the North at little or no profit. At the present time the product of the Northwest has been cut down about three-fourths; what is left in Maine and New Hampshire is largely reserved for the pulp mills, and the South is the base of supplies for pine, and nearly 10,000,000,000 is being cut annually in the regions of Long and Shortleaf Pine; and this lumber is bringing good prices. All of this pine is of good quality, but in many places is but thinly scattered over the land; a fair estimate per acre, averaging all stands together, would be 5,000 feet, board measure, or a little less. This is on a basis of an average of three logs—standard 16-foot size—to a tree, ten to twenty logs per 1,000 feet. These are liberal estimates for timber in the states from North Carolina around the coast to Georgia, and I presume I may include Alabama. There is more timber in Louisiana and eastern Texas, but it will not be there long, as they are cutting it off faster than in any other of the Southern States. I fully believe that after ten years of such removal of the timber as is now being done, there will not be enough left in the states along their lines to supply the three great railroads—the Atlantic Coast Line, Seaboard Air Line, and Southern—now running from Virginia to Texas.

Yet all conditions are favorable for reforestation, and new growths can be depended upon if they have "half a chance." The climatic conditions are unusually favorable, and growth is rapid. I saw 12,000 feet per acre cut from a large tract, and besides seeing it cut, sawed, run through the dry kiln and planing mill, and put on the cars for

the north, I took the trouble to verify the figures. I measured the stumps and tops for myself, and found that the 12,000 feet had been honestly cut from the land. Some stumps had a diameter of 30 inches. A count of the annual rings on many showed that the growth during the first twelve years was marvelous, some of them having grown 8 to 10 inches in diameter.

This was on an old plantation on which I had been as a surveyor in 1854, and the land was then cultivated and planted in cotton. In 1855 the field, having been cropped in cotton or corn for more than 20 years, was "turned out" to grow up to timber, according to the general practice before the inauguration of the present system of fertilizing with phosphates. Where this timber stood at the beginning of the present year I had seen the hills of cotton in 1854; and in February, 1903, the old cotton rows or hills were still to be traced. By getting the cost of all on board the cars and the actual figures of the price paid for the lumber, I found there was a profit of nearly \$100 an acre. On that amount the interest, taxes, and other expenses during the time the trees were growing would be less than \$15 per acre. This stand was on average sandy land in Berkeley county, S. C., west of the Santee River, and about 45 miles north of Charleston.

Another farm that was under cultivation in 1855 was "turned out" to recuperate and grew up to Shortleaf Pine, which was cut off in less than 20 years, and the land again put under cultivation. Again it was left idle and has become one of the handsomest Longleaf Pine forests I have ever seen. The stand is very thick—at least 150 trees to the acre—and they average 50 feet in height and 8 inches in diameter. They stood so even and trim that I was reminded of the planted forests I have seen in Germany between Berlin and Dresden. One reason for the excellence of this stand was because it was near the owner's home and had been protected from depredations, including the most disastrous one of fire. This was in the same county, on the old "King's" road, and the land is a part of the

"Shingler" plantation, on which the Shingler family have lived for more than 100 years. On the estate of "Mexico," owned by Myzeek Porcher in 1854, there is now a magnificent forest. In that year I saw 10,000 of his 15,000 acres in cotton and corn, and the 400 slaves of Porcher gathering the crop. Now these 10,000 acres are well timbered and owned by the Atlantic Coast Lumber Co. of Georgetown, N. C. When I drove through the woods 10 years ago there was then a good stand of saw timber, and last winter when I visited the place again I found the timber large enough to well repay lumbering operations. This place is also in Berkeley county.

I have given these special examples in order that any one who cares to may verify a fact that is true of all the southern Atlantic states. And this fact is, that if there is any protection whatever the lands there will make the finest kind of pine forest growth, because of the excellent conditions and the persistence of the young pines in springing up. The pine belt of these and the Gulf states was almost a "forest

primeval" when I visited the region 50 years ago, with just clearings enough for the cultivated lands of the plantations. These lands, when cropped successively for about 20 years, were turned over to forest growth again, all the better, as far as forest was concerned, for the cultivation which they had undergone. They were seeded from the old trees, and the young trees are not hindered by the scrub growths which in the northwestern states of Michigan, Wisconsin, and Minnesota, immediately spring up after the old forests are removed, and so retard the reforestation of northern pine lands. This difference I have also personally proved, for I have experimented with 10 acres in the Wisconsin woods, taking a sandy loam very similar to the North and South Carolina soil. It was reseeded from an adjacent grove of 50 old White Pines, and fenced to protect it from grazing and all live things. Fires were kept out, and at the end of 25 years of care and trouble I have succeeded in getting a fair stand of young White Pine, none of which is more than 10 feet high.

Had I taken at the same time 1,000



A SOUTHERN PINE FOREST, SHOWING PATH OF A DESTRUCTIVE FIRE AFTER LUMBERING.



WASTEFUL LUMBERING METHODS IN A LONGLEAF PINE FOREST.

acres in South Carolina, at the price then offered me of 50 cents an acre, I would now have a forest worth a great deal of money. This I could have been assured of if I had at that time put on one corner of the tract one of the old slave families, with a cabin and \$200 worth of stock and farm implements, and allowed my caretaker any amount of ground for cultivation up to 100 acres. I would have ordered him to keep out fires, and even if most of the merchantable timber had been culled before I bought I would now have at least 900 acres of good forest, worth many times the original investment and all subsequent costs. In the meantime the old fellow and his dozen "head," as he calls his children, would have made a good living, and my tract would have been an object-lesson for the people of the county. The opportunities are not gone yet, and in some places it is now more than ever true that many such tracts can be found, where the best thing that could be done would be to put some reliable negro and his family on part of the land, his only rental being a patrol of the rest. The

cost would be slight, and with a cabin for one's own use it would pay to go there each year to stay a few days in the pine woods to see the forest growing. The writer has several such tracts and will soon have more. The negroes are actually living there, working the open lands and caring for the forest, and taxes and all other expenses are very light. I can see in this a step toward the solution of some of the "Southern problems" the North talks about, and have come to the conclusion that the negro and the forests in the Carolinas are all right if left alone to work—and grow.

I have spoken of the precautions that are necessary to keep out that gravest of dangers, the forest fire, and I am perfectly satisfied that with this danger eliminated reforestation is assured with no other effort. There are fire laws in nearly all of the Southern States, with adequate penalties, but they, as in other sections of the country, are not properly enforced. Men owning stock, and perhaps 40 or 50 acres of land, will deliberately set fires which burn over many

thousands of acres, "so the grass will start up a little sooner for the stock."

For the first two years the young pine is more intent on pushing its root down into the soil to moisture rather than on reaching upward for light, and the growth is tender, making it an easy prey to fire. On the other hand, the southern pine does not seem to be as seriously affected by grazing as the northern White Pine; yet those persons who should be interested in keeping the fires out give but little heed to the matter and often fail to see that fires alone are the great agents of destruction. Yet those states are worth more today, acre for acre, for the forests they can grow with the cheapest kind of care than for the corn and cotton which they produce; and I feel that I am stating only the truth of the matter when I say that with fire protection such as the State of Minnesota now has, these states will be rich in their woodlands, for only one-fourth of their total area is under cultivation or ever will be. They could then raise

even more cotton and corn than they do now. Personally I would rather own the "old fields" of the South, with their forest possibilities, if the flames are kept out, than the bonds of any railroad in the United States from the standpoints of safety of the investment and eventual sure returns. Moisture, climate, and soil are all there, but, with the forest floor annually burned over, growth is retarded, if not effectually checked. Moisture for the forest and other uses is not retained in the soil, roots are exposed, and there is loss where there should and could be gain. If each state spent \$5,000 annually in preventing fires, for patrols, for the enforcement of the fire laws, and for the promotion of interest and knowledge among the people, who hardly realize the great loss suffered by the community in a forest fire, they would accomplish more real good than they could with the expenditure of \$500,000 in any other way.

This is not the sentimental "forestry" of "Woodman, spare that tree." It is



PINE TREES 16 INCHES IN DIAMETER, THE RESULT OF NATURAL REPRODUCTION IN AN OLD FIELD WHICH WAS CULTIVATED AS LATE AS 1877.

a matter of dollars and cents, and if I had a million dollars to invest I would sooner put it in southern pine lands, where there was some timber and the chance for more to grow, with a fire law enforced, than in any other form of investment that I can think of. It is fortunate that men who know the value of this timber are beginning to buy it up, and to improve forest conditions through knowledge and management. Yet when the legislatures of the various states meet next fall, the subject of practical forestry should receive the attention it deserves, for there is no part of the country where it is so natural for the forests to grow, nor where they are so easily maintained, as in the south Atlantic states.

And this brings us naturally to the question of state or national aid in the work of caring for the forest interests of the great pine belt of the South. It extends from Virginia through North and South Carolina and Georgia, and follows the Gulf states to and into Texas. It is about 2,000 miles long and approximates 200 miles in width, or, in other words, it contains more than 250,000,000 acres. When I first went through this country very little of it was cut, but at the present time much is being destroyed either through carelessness or wantonness. It certainly seems desirable that the national government, which has created many reserves in the West, should turn its attention to the needs of this region—which has not a single reserve—where cheap lands, con-

ditions of soil and climate, and accessibility make it seem particularly desirable. There would be no expense other than the setting aside of the land and the patrolling of it to keep out fire, as the pine would take care of itself and be an object-lesson to all the surrounding country. In fact, the Department of Agriculture has already spent several hundreds of thousands of dollars in an effort to make tea grow in the Carolinas, while very little has been spent in tree saving. And, so far as direct returns bear on the subject, it would seem that the trees were worth much more than the tea, and the relative expense should have been in an inverse proportion. The western and the Appalachian forest reserves are known to be worthy projects by all who have given the matter any consideration, and I would add my plea for a "Southern Pine Forest Reserve," where the Longleaf, Loblolly, Slash or Rosemary, and the Shortleaf Pines will grow. This reserve should be about 50 miles from the coast, and might include any desired amount of land. If Congress should pass an act enabling the United States to acquire a suitable area, perhaps 100,000 acres, each state in which the lands might lie could set aside the state lands suitable for the purpose and let the general government have full control over them, as in the case of the western reserves. It would be the best possible use that could be made of much of the land and an invaluable lesson to the citizens of the entire South.

## THE ELEVENTH NATIONAL IRRIGATION CONGRESS.

THE ANNUAL SESSION WILL BE HELD AT OGDEN, UTAH, SEPTEMBER 15-18, 1903—SOME OF THE SPECIAL FEATURES WHICH WILL MAKE IT ATTRACTIVE AND VALUABLE TO THE PEOPLE OF THE WHOLE UNITED STATES.

**G**REATER effort than ever before has been put forth to make the coming session of the National Irrigation Congress a notable one. Various causes have tended to produce this re-

sult. In the first place, the State of Utah, which is to be congratulated on the fact, has made an appropriation of \$6,000 to make the congress a success, and is the first state which has taken



such a step. Its citizens have duplicated the sum by private subscription. Government scientists will be in attendance and a number of high officials, including the Secretary of Agriculture, will deliver addresses. President Roosevelt has endorsed the Ogden Congress very warmly. But more than all, there has been a more marked enthusiasm and *esprit de corps* among the promoters of the meeting than has been heretofore displayed, and the zeal with which preparations are being made and the care for every detail is full warrant for an excellent session.

This convention touches on matters of vital concern to the American nation, for no question of national growth is of more importance than this one of internal expansion, the annexation of arid America. Delegates will be present from all states and territories and the governors of several will also be in attendance. The facts adduced from such a meeting will have an important bearing on the expenditure of the \$10,000,000 which has been appropriated or set aside under the provisions of the national irrigation act for the reclamation of the sixteen states and territories specified in that act. It is particularly appropriate that this great bound in the irrigation spirit should find its expression in Utah, the pioneer state in irrigation science.

First of all, the congress will be practical. It will draw its influences from irrigation experts, practical farmers, fruit growers, representatives from state and national agricultural institutions, engineers, foresters, press representatives, business men, manufacturers, officials, and law-makers. The program will include practical lessons in irrigation and forestry, reports of experts, application of provisions of the reclamation act, state progress under the national act, views on the settlement of legal complications, and the pertinent and important theme of colonization. Already the presence of the following has been assured: Hon. James Wilson, Secretary of Agriculture; Senator W. A. Clark, President of the Congress; Gifford Pinchot, Forester, U. S. Department of Agriculture; F. H. Newell,

Chief Engineer, U. S. Reclamation Service; Charles D. Walcott, Director, U. S. Geological Survey; George H. Maxwell, Executive Chairman of The National Irrigation Association, and a number of others whose interest in forest and irrigation matters is well known. Newspaper correspondents representing the important papers of the country have been provided for in a special excursion from Washington, and their accounts of the meeting and of the irrigated country, through which a carefully arranged itinerary will take them, will be of great benefit in spreading the tenets of the irrigation faith throughout the country.

To sum up, it may be said that the wish expressed by President Roosevelt in his address endorsing the Congress, which was delivered in Ogden during his recent western tour, will be more than realized. He said:

"I am delighted that the National Irrigation Congress is to be held here next fall, and I congratulate the State of Utah upon the fact that its legislature was the first ever to pass an appropriation for such a congress. There can be nothing of greater importance to the welfare and growth of this country during the half century that is opening than this question of irrigation. . . . I most earnestly hope that you and all the other states in interest will push and will in every way endeavor to make the meeting of the Irrigation Congress here in Ogden a thorough success; and I say that not merely in the interest of the states which are to be benefited by irrigation, but in the interests of the Union, I want to see that Congress a success; I want to see the work of irrigation made the greatest possible success."

In addition to the Irrigation Congress there will be held at the same time, in Ogden, an Arid States' Fruit Exhibit with the general features of a fair, at which the usual attractions will be present. This exhibit will have an added interest from the number and value of the prizes offered, among which will be loving-cups, gold and silver medals, and cash prizes. Senator W. A. Clark, of Montana, has offered a \$500 loving-cup for the finest exhibit of fresh fruits grown under irri-

gation; the Pabst Brewing Company, of Milwaukee, offers a beautifully designed silver loving-cup, representing "Ceres," for the best exhibit of barley grown in the arid states and territories,

and H. C. Havemeyer, of New York, in behalf of the American Sugar Refining Company, offers a cup valued at \$500 for the best exhibit of sugar beets grown in the arid or semi-arid regions.

## FORESTING THE NEBRASKA SAND-HILLS.

NOTES ON THE PROGRESS OF THE GOVERNMENT WORK IN THE TREELESS WEST.

BY

C. A. SCOTT,

BUREAU OF FORESTRY.

THE Nebraska forest reserves are sand-hill reserves; they were set aside by presidential proclamation on April 16, 1902, for the purpose of determining whether or not trees can be grown successfully in the sand-hills. We believe this to be possible and entirely practicable, and it is our purpose to improve the general conditions of the country by establishing forests on these reserves. The presence of trees on the hills that are now as bleak as anything that can well be imagined will beautify the country and in time supply the local demands for forest products.

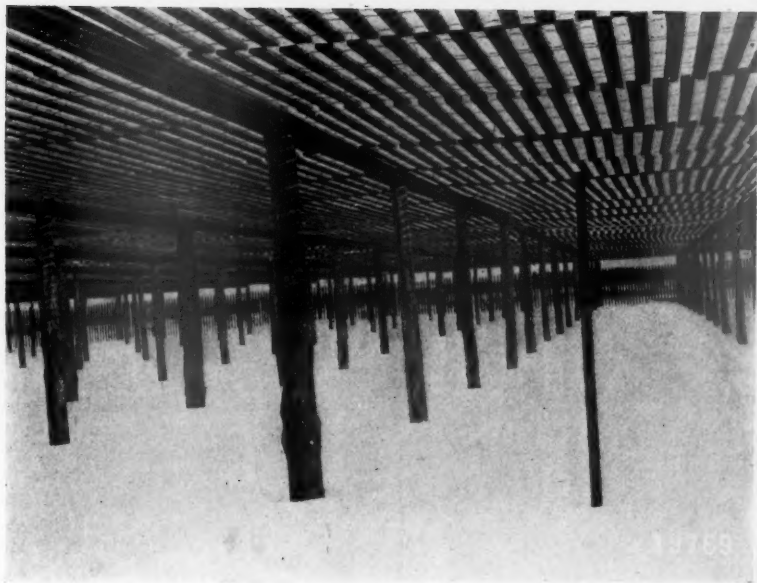
It is hoped that the results of this work will be of great value to the people of the entire state. If we find by experiment that certain trees are well adapted to our conditions, and that they grow and flourish in the sandy soil, we can then recommend such trees for general planting.

The Dismal River Forest Reserve, because of its nearness to the railroad and base of supplies, was selected for the seat of our work. This reserve contains 86,000 acres and lies between the Dismal and Middle Loup River, in Thomas county. During the summer of 1902 this reserve was surveyed and a nursery site chosen. The most suitable location for a forest nursery was found along the Middle Loup River, 2 miles west of Halsey, where we established our headquarters and began permanent improvements.

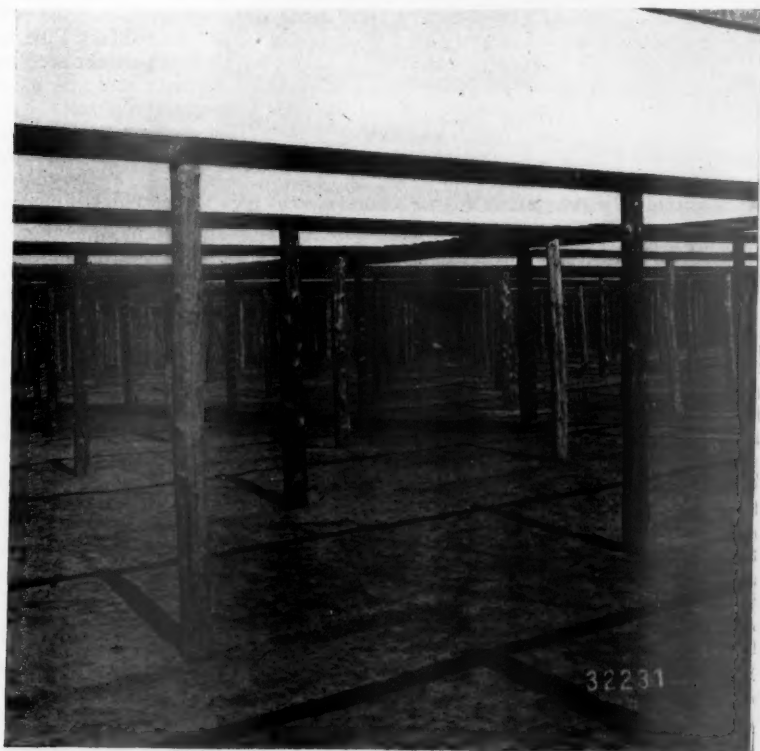
The Bureau of Forestry had decided to grow from seed the trees that are to be used in planting this reserve. The very first work begun was the preparation of a one-half acre seed-bed. The site chosen for the nursery grounds is bottom land lying close to the river and about 8 feet above the level of the water. The ground, before being cleared, was grown up to a thicket of plum and choke-cherry brush. Strange as it may seem, the very first tools we made use of in preparing for the coming forest was a mattock, one of the worst enemies a tree has.

The ground was grubbed, plowed, harrowed, and raked, the latter operation being repeated until the soil was free of roots and in proper condition to receive the seed. The seed-bed block was then set with 8-foot posts, placed 8 by 8 feet each way. These support a roof of woven picket fencing, which affords the little seedlings partial shade and shelter from the wind and hail. The entire enclosure when completed resembled a huge chicken coop. The separate seed-beds within the enclosure are 7 feet wide by 136 feet long. Each bed has a capacity of 20,000 seedlings, and there are 21 such beds in the half-acre block.

After the preparation of the seed-beds came the collecting of pine seed. A party of four men were sent into Pine Ridge and the Black Hills to collect seed of the Bull Pine (*Pinus ponderosa*), and



INTERIOR OF SEED BED DURING THE WINTER, 15 INCHES OF SNOW ON LEVEL.



VIEW OF SEED BED BEFORE THE SLAT ROOFING WAS PUT ON.



RESERVE BUILDING, DISMAL RIVER FOREST RESERVE, NEBRASKA.

two men were sent into the forests of Michigan and Minnesota to collect Jack Pine (*Pinus divaricata*) seed. A large quantity of Red Cedar seed was gathered along the Platte River, in western Nebraska. It was late in the season before the seed was received at the reserve headquarters, and we succeeded in planting only five of the seed-beds before winter set in.

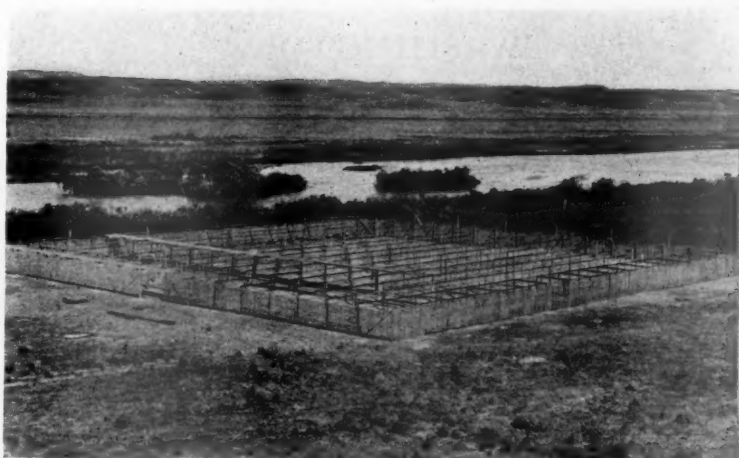
With the opening of spring seed planting was resumed, the remainder of the original half-acre block was planted, and another half acre was prepared in a similar manner to the first, and this was also planted in pine seed.

As to the kind of seed that is doing the best with us, I believe that I can safely say that the seedlings from the fall-planted Bull Pine seed are much ahead of any of the others. The trees

are larger and have withstood the attacks of fungus diseases more successfully than any of the spring planting. Some of the seed that we planted failed to germinate; other species germinated only a small per cent and came up so slowly that they were quite provoking. The Jack Pine seed, which is very small, germinated readily, but because of the extreme tenderness of the little trees this species suffered a heavy loss by damping off. However, there are yet enough surviving plants to make a fair stand. It is altogether probable that fall-planted Jack Pine seed will produce seedlings that will withstand damping off fully as well as the Bull Pine have done. Damping off is a fungus disease which is common during warm, moist

weather, and it attacks the trees during the very early stages of their growth.

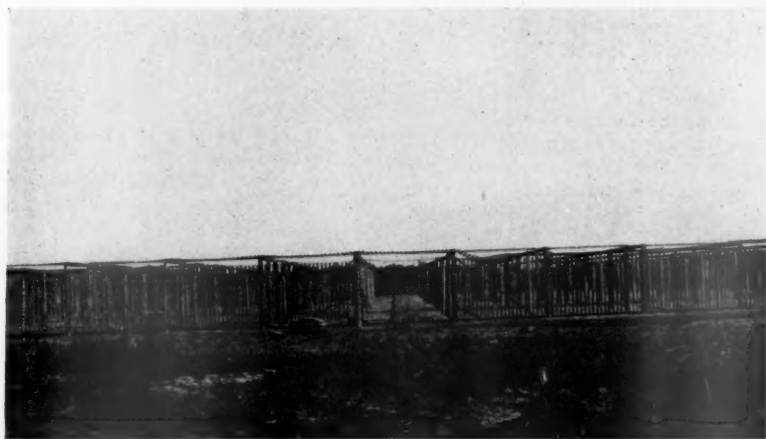
This season marks the beginning of the work on the Niobrara Reserve, which contains 126,000 acres, lying between the Niobrara and Snake rivers, in Cherry county. We have at present a party of six men surveying the boundaries and making a thorough study of the woody species found growing there and of the conditions under which they are growing. In my trip across the reserve last week with Professor Emerson and Mr. Mast we were highly pleased to find the conditions there so favorable to our work. The reproduction of the Red Cedar and the Pine along the rivers, creeks, and canyons is splendid, and we found some comparatively young trees growing out in the hills. The rank growth of grass now covering the



VIEW OF NURSERY BED ON DISMAL RIVER FOREST RESERVE, NEBRASKA. LOUP RIVER AND SAND-HILLS IN THE BACKGROUND.

hills will prevent further natural reproduction. There still remains a few scattering trees of the forest of the hills; these are veterans of many years and the stumps of their comrades which long since fell before the axe are still evidence of the mighty trees that once

studded the hills. Some of these stumps were found by measurement to be as much as 28 and 32 inches in diameter—wonderful trees for sand-hills. We believe that where forests once grew, forests can certainly be made to grow again.



EXTERIOR VIEW OF SEED BED; OPEN SPACE IN CENTER USED FOR AN ENTRANCE.



## THE PRACTICE OF IRRIGATION IN WASHINGTON.

IRRIGATED AREA HAS BEEN GREATLY INCREASED DURING THE LAST THREE YEARS—EXAMINATION OF WATER RESOURCES BEING MADE BY NATIONAL GOVERNMENT.

**T**HAT the people of Washington are turning more and more to irrigation as a means of developing the state's resources is shown by recent Census Office reports. The statistics covering the past three years, the period since the census year 1899, shows a very substantial increase in the area under irrigation and the number of irrigators.

Especial interest is now being shown in the development of eastern Washington, owing to the fact that the United States Reclamation Service is making a preliminary examination of the water resources of the region with a view of determining the advisability of constructing national irrigation works. About 2,600,000 acres of public land have been withdrawn from entry pending the result of this examination. In view of this the following account of irrigation development in Washington up to the present time will be of value:

Irrigation in Washington is confined practically to the territory east of the Cascade Mountains, which, ranging north and south, divide the state into two parts dissimilar in topography, soil, and climate. The Columbia River drains all of the eastern territory.

There has been considerable increase since 1899 in the irrigated area of the state and in the number of irrigated farms. Beside the ditches actually operated in 1902, there are a number of ditches, some of them covering an extensive area, which did not carry water until 1903.

In 1899 the number of irrigators in Washington was 3,513, and the number of acres irrigated 135,470. The figures for 1902 are, respectively, 4,585 and 154,962. The cost of irrigation systems in operation was, in 1899, \$1,679,319, and in 1902 \$2,330,758. The total length of main ditches in 1902 was 1,095 miles.

### IRRIGATION FROM THE COLUMBIA RIVER AND ITS TRIBUTARIES.

The Columbia River, including Clarks Fork, heads in the Rocky Mountains west of Helena, Montana. It crosses the northern part of Idaho and flows northwestward across the northeastern corner of Washington until it reaches the international boundary; there it makes an abrupt bend and flows in a general southerly direction until it turns west a few miles below the mouth of Snake River and forms the boundary between the states of Oregon and Washington.

Next to the Colorado, the Columbia is the largest river in the arid region of the United States, its drainage basin including parts of Oregon, Washington, Idaho, Montana, and a large area in Canada. The entire drainage area of the Columbia River is 216,537 square miles, about one-half of which belongs to the Columbia River proper and one-half to its main branch, Snake River.

The portion of Washington drained by the Columbia River is arid and semi-arid, and, except in a few localities, irrigation is necessary for continuous successful farming. The valleys comprise some of the most productive farming lands in the United States, having a deep soil of apparently alluvial deposits mixed with volcanic ash with an underlying bed of clay. The soil of the uplands is less fertile, but produces with sufficient moisture heavy wheat crops.

### BELOW SNAKE RIVER.

Most of the territory in Washington drained by the Columbia River and its tributaries below the mouth of Snake River produces crops without irrigation, but for some crops, and especially for hay and fruit, many find the artificial application of water desirable.

In 1902 the number of irrigators was



AN IRRIGATED ORCHARD IN THE YAKIMA VALLEY, WASHINGTON.

387; the number of acres irrigated, 8,252; the number of irrigation systems in operation, 135; the cost of construction of the operated systems, \$45,998, or an average cost of \$5.57 per acre irrigated, and the total length of main ditches, 99 miles. Irrigation was chiefly from the Walla Walla River and its tributaries.

#### IRRIGATION FROM SNAKE RIVER.

SNAKE River enters Washington near Lewiston, Idaho, and joins the Columbia near Pasco. In 1902, 911 farms of Washington, with an irrigated area of 4,968 acres, were watered from this river, its tributaries, and the springs and wells in the drainage basin. There were operated 77 irrigation systems, representing an initial expenditure of \$109,853, or an average first cost of \$22.11 per acre. There were 68 miles of main ditch. Most of the irrigated land lies in Asotin county. From Asotin Creek and its tributaries 810 farmers irrigated 3,225 acres from 6 irrigation systems, costing \$94,100. The total length of main ditches was 26 miles.

#### IRRIGATION FROM THE YAKIMA RIVER.

Nearly four-fifths of the irrigated acreage of Washington and nearly half of the irrigated farms are found in the Yakima Valley. The Yakima River has its source in Keechelus Lake, on the eastern slope of the Cascade Mountains, in Kittitas county, Washington, and flows through Kittitas and Yakima counties, joining the Columbia River near Kiona.

There has been since 1899 important development of irrigation systems in the Yakima Valley. Two large canals have been constructed, and the older systems have been extended. Some of these systems had difficulty in securing water in 1902, and unless storage reservoirs are constructed in the mountains, it is not probable that there will be any further important development of irrigation from this river. The total number of farms irrigated in 1902 from the Yakima River and its tributaries and from springs and wells in the Yakima Valley was 2,505, and the area irrigated 121,705 acres. There were operated 255

irrigation systems, which cost \$1,968,555, or an average cost of \$16.17 per acre irrigated. The total length of main ditches was 618 miles. More than half of the irrigated area in the valley is watered from the Yakima River direct. The principal tributary of the Yakima River is the Naches River, which in 1902 supplied water to 575 farms, having an irrigated area of 20,232 acres.

Irrigation from the Columbia River between the mouth of the Okanogan River and the mouth of the Yakima River is practiced chiefly for fruit growing. In 1902 there were 500 irrigated farms, having an irrigated area of 14,378 acres. The irrigation systems, 189 in number, cost \$168,364, or an average initial cost of construction of \$11.71 per acre irrigated. There were 209 miles of main ditches. About half the irrigated farms in this division are watered from the Wenatchee River and its tributaries. In 1902 there were 253 farms, having an irrigated area of 3,285 acres, watered from this stream. There were in operation 34 irrigation systems, which cost \$95,755.

While the percentage of increase of irrigation from the Okanogan River and its tributaries since 1899 has been large, the irrigated area is small. There were, in 1902, 62 irrigated farms and a watered area of 2,257 acres. The 45 irrigation systems in operation cost \$12,374, or an average first cost of \$5.48 per acre irrigated. The total length of main ditches was 34 miles. Most of the irrigated land is watered from the Similkameen River and Conconully Creek and their tributaries.

There is very little irrigation in Washington from the Columbia River and its tributaries above the mouth of the Okanogan River. In 1902 there were 126 irrigated farms, with an average irrigated area of 18.9 acres, and 78 irrigation systems representing a construction cost of \$14,369, or an average cost of \$6.05 per acre.

#### IRRIGATION IN WESTERN WASHINGTON.

The western or coast portion of the state is humid, and irrigation is not generally practiced, but, owing to the

slight rainfall in the summer months, there is a growing disposition to apply water artificially to the land during the periods of drouth. More than one-half of the irrigated acreage in western Washington is reported for the valley of the Dungeness River, a region of rich and deep soil producing remarkable

yields. In 1902 there were reported for western Washington 94 irrigated farms, having an irrigated area of 1,025 acres. Sixteen irrigation systems were in operation. These represented a construction cost of \$11,245, or an average of \$10.97 per acre irrigated. There were 17 miles of main ditches.

## FOREIGN TRADE IN FOREST PRODUCTS.

IMPORTS EXCEED THE EXPORTS, THOUGH RECENT STATISTICS INDICATE THAT THIS CONDITION SOON MAY BE REVERSED.

THE United States is so generally considered a producer of forest products that it will possibly surprise many persons to know that during the calendar year just past the imports of forest products exceeded the exports by more than \$10,000,000. The total value of importations amounted in 1902 to about \$60,000,000, or 6.6 per cent of the total, while the exports were valued at about \$50,000,000, or 3.6 per cent of all goods sent out. While the exports are now exceeded by the imports, it seems to be indicated by the trend of trade in the past few years that this condition will be reversed, though there can be no diminution in our imports, for they are composed for the greater part of products which cannot be found in the United States. For example, the principal item among the imports comes from the various gums from which rubber is made, and last year they were imported to the value of \$25,000,000, or nearly one-half of the total. Ordinary lumber, to the value of nearly \$20,000,000, came next in importance, and of this the common sawed lumber, most of which came from Canada, was worth \$12,000,000. Round timber was also received from Canada, and various cabinet woods, such as mahogany, most of which came from Mexico, Nicaragua, and Cuba, were worth more than \$3,000,000. Then there were dye-woods, chief among which was logwood, and various gums used in the arts and industries, including camphor, shellac, and \$1,000,000 worth of chicle, which

forms the basis for the chewing gum annually used by the American girl. Wood pulp, most of which came from Canada, was worth \$2,000,000, and cork from Portugal and Spain amounted to almost that much. The rest of the imports included cinchona bark, from which quinine is made, and various other products used in medicines, as well as some vegetable ivory, natural palm leaves, charcoal, hemlock bark, naval stores, such as tar, pitch, and turpentine, and other miscellaneous things in quantities too small to be specially classified.

Of exports from this country, the principal item comes from ordinary boards, deals, and planks, of which nearly 1,000,000,000 feet were shipped, the value being \$17,000,000. Joists, scantling, staves, headings, shooks, shingles, and other lumber exported were worth about \$10,000,000, and round, hewed, and sawed timber exported was worth about the same. Naval stores, such as turpentine, rosin, tar, and pitch, most of which went to the United Kingdom, were valued at \$12,000,000. Wood pulp exports amounted to \$740,000 worth, and were marketed almost entirely in two countries—the United Kingdom and Belgium. Most of the tan bark sent abroad during the year went to Japan.

Two countries—Brazil and Canada—stand out conspicuously among those which furnish forest products to the United States. Generally Brazil is in the lead in value of imports, but last

year the values from that country were slightly below the annual average, while those from Canada were above, and for the first time in many years outvalued those of Brazil, and led those of all other countries. Brazil's lead comes from the great quantities of rubber she sends to the United States, while Canada's importations are chiefly lumber. The two together furnish imports to the value of \$33,000,000, or considerably more than half of the entire volume from foreign countries. After these countries come the United Kingdom, British East Indies, Belgium, Portugal, Germany, British Oceania, and Mexico, in order, and all of these import forest products to the value of \$1,000,000 or over.

Of our exports, the United Kingdom, in lumber as in most other things, took

the greater amounts, the forest products shipped to that destination having an aggregate value, in 1902, of \$16,231,000. No other country took nearly so much, and the next in order was Germany, with \$4,233,000 worth. Then followed the Netherlands, Canada, Mexico, Belgium, France, British Australasia, Argentina, and Italy, in order, all of these taking products valued in excess of \$1,000,000.

These statistics, which were prepared by the Division of Foreign Markets of the Department of Agriculture, naturally include only what might be termed the raw forest products, and the vast amount of manufactured articles which use wood in their construction, such as furniture, farm machinery, carriages, and other finished products, are not counted in such a tabulation.

## FOREST FIRE RECORD.

IN ACCORDANCE WITH ESTABLISHED RULE, THE SCENE OF GREAT FOREST FIRES DURING AUGUST HAS SHIFTED FROM THE EAST TO THE WEST.

**I**N the fall of the year the scene of forest fires, like the "course of empire, westward takes its way." With the exception of a single fire in the New England States, there has been none of any great magnitude east of the Mississippi River since our July record, and only one east of the Rockies. Colorado and Utah were both visited by forest fires, but with the exception of these the greater part of the destruction has been confined to the three states on the Pacific Coast—Washington, Oregon, and California.

**New Hampshire.**—A fire two miles north of North Danville started July 27. Besides doing considerable damage to standing timber, destroyed 25 cords of wood and 200,000 feet of sawed lumber, most of which was insured. The fire started from a lighted match carelessly thrown on the ground by some wood-choppers.

**Minnesota.**—Mayor Stein, of Cass Lake, Minnesota, who, under the laws of Minnesota is a deputy fire warden

by virtue of his office, sent a telegram to General C. C. Andrews, Chief Fire Warden of the state, saying that forest fires were burning on Star Island, which is government land, reserved by the Morris bill. This was on July 28. General Andrews replied, "Take 30 to 60 men and quell fire." This was done, and the action was in marked contrast to the quibbling between government and state rangers as to who should put out a California fire which was in disputed territory. While their petty fight as to jurisdiction was going on, the fire was burning and gaining headway.

**Colorado.**—What was at first reported as a serious forest fire on Cameron's Cone, near Colorado Springs, turned out to be a brush fire which did little damage, and was extinguished by railroad section men within three hours after it started, on August 5. The promptness of their work averted what might have been a damaging fire, as there is much inflammable timber in the neighborhood.

**Utah.**—Brush fires, started by camp-



ers, threatened to destroy Binghamton, a mining town 25 miles south of Salt Lake City, on August 3. It was feared that the town would be destroyed, but a force of 300 miners succeeded in turning the flames away from the town, and later extinguished the blaze before it did much damage.

**Oregon.**—On August 15 the Associated Press reported a forest fire which had destroyed millions of feet of timber, and was threatening saw-mills and ranches in the mountains near Sparta, not far from Baker City. The fire had been burning for a week when first reported, and reached serious proportions on the 15th. At that time it was still spreading its area, and unless checked threatened the timber on the whole Cornucopia Range.

**Washington.**—The first forest fires of the season reported in Snohomish county occurred July 24, and at that time had crossed the boundary line from Kings county and were traveling north through heavily timbered country. Instructions were sent to deputy game wardens by the county commissioners to secure as many men as possible and check the flames. This was done, and the damage reported at that time was slight. Later fire destroyed the Wheeler-Osgood Company's plant at Everett, causing a loss of about \$30,000, of which \$15,000 was insured. This was the second time that fire swept through the plant in the past few months. The company will probably not rebuild at Everett, but will consolidate its interests at Tacoma, where it is already established. On August 18 a forest fire burned near Elk, 25 miles north of Spokane, covering nearly 1,000 acres in a tract of burned-over pine and cedar. For four days more than 100 men fought the fire, but could not control it, and the latest reports were that 12,000,000 feet of timber had been destroyed.

**California.**—The first serious fire of the summer in the San Gabriel Reserve occurred on the Prairie Fork of the San Gabriel River, north of Baldy and 3 miles from the Big Horn mine, on July 30. Thirty rangers were immediately concentrated at the spot and, aided by 20 men from the mines, fought the

flames, which were under control in two days. For the next two months, or until the heavy winter rains set in, the San Gabriel and San Bernardino Forest Reserves, on whose safety the permanency of the water supply of southern California depends, will be in constant danger from fire. A continuation of the differences of last year between the state and government rangers, according to newspaper reports, disgracefully marked the progress of the fires which burned in and near the Yosemite National Park. For several weeks prior to August 4 fires had been burning near that gateway to the park guarded by El Capitan and Cathedral rocks. Both state and government forces claimed that a fire near Glacier Point was in the other's jurisdiction, with the result that the flames progressed unchecked for some time. Then when state and government lands were both damaged, the fire fighters—the park guardian with his troops and the state fire wardens—got to work, only after considerable damage had been done which might have been averted in the first place if the fires had been fought in the interests of all, regardless of where they were. Both sides seem to have been at fault, for both withheld aid while the fire was burning. Considerable damage was done to the pine and oak groves which cover the mountains.

On August 4 Alden L. Youngman, of Glen Ellen, brought suit against the Southern Pacific Company for \$2,700 damages sustained by a fire which devastated his property a year ago. It is alleged that the fire was started by a locomotive of the defendant corporation. The outcome of this suit will have a bearing on the attitude of railways toward fires started by their engines or employes, and will be important from the fact that at least one-half of the forest fires now occurring in the country are directly due to railroads. Several hundred men battled with a fire in the neighborhood of Relief Hill, near Nevada City, for four days, and then did not have it under control. By July 9 it had burned over 5 square miles of timber land, and was still burning. Much cut lumber was also destroyed by

this fire, and flumes were saved only by arduous fighting. A fire in the mountains near Caliente, 30 miles south of Bakersfield, destroyed grass on ranges, grain fields, and forest. It burned many thousands of acres, and was fought by train crews of the Southern Pacific and Santa Fé companies, as well as by paid fighters hurried to the scene by the Kern County Land Company, whose holdings were endangered. On

August 9 it had burned three days, and was not then under control.

**Canada.**—A message from White Horse to Vancouver, dated August 1, said that a destructive brush fire in that neighborhood had assumed serious proportions along the line of the White Pass and Yukon Railway. Every available man fought the fire until quelled, though not until much damage had been done.

## RECENT PUBLICATIONS.

*Any of these books will be sent by the publishers of "Forestry and Irrigation," postpaid, to any address on receipt of the published price, with postage added when the price is marked "net."*

**The Water Fowl Family.** By LEONARD C. SANFORD, L. B. BISHOP, and T. S. VAN DYKE. 20 full-page illustrations. Pp. 598. The Macmillan Co., New York.

This volume is the latest issued as a part of the American Sportman's Library under the general editorial supervision of Caspar Whitney. It contains fourteen chapters on the shooting of ducks, geese, swans, and shore-birds, by L. C. Sanford. T. C. Van Dyke is the author of the portion devoted to the water fowl of the Pacific coast, while L. D. Bishop supplies a detailed description of each bird as it is brought into prominence in the text.

The entire volume is written in an entertaining style, the three authors collaborating being among the best of our sporting writers. The subjects have been treated throughout in a popular way, rendering the book not only valuable as a sort of encyclopedia of the water fowl family, but enjoyable reading for the average sportsman.

A valuable feature of the book is the large number of excellent full-page drawings by Louis Agassiz Fuertes, Charles Livingstone Bull, and Martin Justice. Large clear type, good paper, and attractive binding combine to make it an excellent piece of book-making.

**The Improvement of Rivers.** A Treatise on the Methods Employed for Improving Streams, for Open Navigation, and for Navigation by Means of Locks and Dams. By B. F. THOMAS and D. A. WATT. Pp. 356, quarto size. Illustrated with 92 full-page and folding plates. Price, \$6.00 net; postage, 47 cents. John Wiley & Sons, New York.

At this time of rapidly growing interest in the use of our rivers for navigation, irrigation, and the related problem of controlling flood waters, this book is most timely. It is claimed to be the first work of its kind printed in the English language.

The object of the book is to provide in concise form a description of the various systems

employed for bettering the conditions of navigable streams, together with the methods usually adopted for their design and execution. This branch of engineering is practically untaught in the engineering schools of the United States, but the authors hope that the publication of this volume may have some effect in calling attention to this defect, and perhaps result in widening the scope of some of the usual engineering courses, and thus prepare students for the engineering service of the government.

The volume is divided into three parts: Part I is devoted to general improvements of rivers; Part II, improvement of open rivers, and Part III treats of the improvement of rivers by canalization. Dikes, levees, storage reservoirs, locks, canals, and the various kinds of dams are all described at length. The many excellent illustrations and the fact that the book is written in plain language, free from many of the usual technical engineering terms, renders it of value to the general reader as well as the technically trained man.

**The Woodlot.** By HENRY SOLOMON GRAVES, Director of the Yale Forest School, and R. T. FISHER, Bureau of Forestry. Pp. 90. Illustrated by photographs and diagrams. Bulletin 42 of the Bureau of Forestry, U. S. Department of Agriculture. Washington: Government Printing Office, 1903.

This bulletin is intended to be of value to owners of woodlots, particularly in New England, where the material for its preparation was gathered. Its most interesting and unique feature lies in the series of diagrams, where, by outlines of trees and explanatory text, improvement and reproduction cuttings are graphically explained. With the aid of these, any one who gives the bulletin a careful reading should be able to make the most of the possibilities of any given woodlot area.

The first part of the bulletin explains fully the meaning of improvement and reproduction

cuttings, tells when, how, and why they should be made, and sets forth the benefits to follow. There are also suggestions for pruning, the protection of forests against fire, grazing, insect enemies, and storms, and a general discussion of New England woodlands and the practicability of forestry. It can be said that from this latter viewpoint—that of practicability—this is one of the most important bulletins recently issued by the government.

#### PUBLISHERS' NOTES.

The success of FORESTRY AND IRRIGATION'S Real Estate Department has been so marked that its management has felt justified in greatly increasing the space devoted to it. Some idea of its scope may be obtained by glancing at the advertisement of its properties among the back pages of this issue. The ready reception which such a department has met is due, we feel, to the fact that the magazine itself guarantees honest treatment, and requires no money unless sales are actually made. Moreover, all properties listed will bear out everything claimed for them, and in most cases will prove much more attractive than the brief advertising announcement proclaims them. Any one interested in buying or selling real estate, no matter where situated, will do well to correspond with the manager of the Real Estate Department, Lee M. Lipscomb, FORESTRY AND IRRIGATION, Atlantic Building, Washington, D. C.

The Hardy Catalpa has been proved by long experiment to be an excellent tree for timber purposes, and this, with its remarkably rapid growth, makes it valuable for plantations, either as a source of domestic supply or for an investment. George W. Tinch, at Wilsey, Kansas, has had considerable experience in growing this species, and reports remarkable success. He can supply seedling trees in large numbers for plantation purposes, or he will take contracts for setting out plantations of 60 acres or more. Those who wish to grow the Catalpa can correspond to advantage with Geo. W. Tinch, Wilsey, Kansas, whose advertisement appears in this magazine.

The general increase in interest in the problems of reforestation has an expression in an advertisement in the present issue of FORESTRY AND IRRIGATION. We refer to the announcement of the Scandinavian Tree Seed Establishment, conducted by Johannes Rafn, Copenhagen-F, Denmark, which appears among the advertising pages and requests correspondence with first-hand collectors of tree seeds, of both conifers and hardwoods. There has been a lately growing demand for American tree seeds in Europe, both for ornamental and forest purposes.

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"Wonderland 1903" has a chapter on this subject which may interest you. The book is published by the Northern Pacific Railway Company and if you send six cents in stamps to **CHAS. S. FEE, General Passenger Agent, St. Paul, Minn.**, he will send you a copy.

There are also other chapters of interest—amongst them one on Yellowstone Park, another on Puget Sound, and yet another on the Columbia River.

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# REAL ESTATE

**FORESTRY AND IRRIGATION** conducts a real estate department, the services of which are offered to all readers of this magazine. It will endeavor, through judicious advertising and correspondence, to buy and sell property of every kind. In other words, this department will act as an agent in any transactions our readers may have involving real estate. For this service there will be no charge unless a sale is concluded, when the usual commission will be expected.

To all interested we would say that it costs no more than the postage from your end to make known your wants—either to acquire or dispose of property.

We desire to impress our patrons with the fact that this magazine guarantees honest treatment. The Real Estate department is managed by competent and experienced men who will devote their best efforts toward building up a national business and a national reputation for fair dealing. We call particular attention to the fact that no property will be listed on our books that will not bear out under the closest investigation everything that is claimed in its behalf. While we wish to handle small properties and will give them careful attention, we propose to make a specialty of large properties and enterprises, as we have exceptional opportunities for reaching capital seeking paying investments, especially in the West and South. The character of investments which seem to be most in demand are manufacturing sites, farming, grazing, and timber lands. We also have inquiries relative to orange groves both in Florida and California.

## PROPERTIES FOR SALE

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### FLORIDA—Continued

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(4) 390,000 acres, located on a navigable river, with transportation to the Gulf of Mexico. This tract contains a large area of valuable cypress. The cut will average from 2,000 to 3,000 feet per acre of cypress and pine. This land, aside from the value of its timber, is also one of the finest cattle ranges in the state.

(5) 230,000 acres; this tract has about the same characteristics as tract (4).

(6) 110,000 acres; estimated cut of timber is 1,500 feet per acre. This tract is within the citrus fruit belt of the state and will be valuable for either colonization or cattle-raising after the timber is cut. A new railroad is being built through this tract.

(7) 90,000 acres; this tract contains 70,000 acres of Longleaf Pine and 20,000 acres of Cypress. The timber is estimated to cut from 2,000 to 3,000 feet per acre. A large sawmill costing \$40,000 is located on this land and is included in the sale of the land and timber. This mill is located on a river to which a great deal of this tract is contiguous.

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(10) 30,000 acres of fine grazing land, being one of the best cattle ranches in the state.

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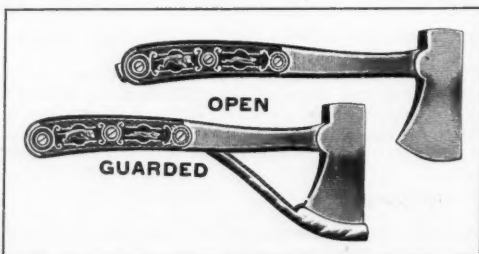
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